EDITORIAL
DOMESTIC ENGINEERING

Whole No. 1554 CHICAGO, SEPTEMBER 23, 1922 Vol. 100, No. 13

VOCATIONAL SCHOOLS AND APPRENTICES.

A SIGNIFICANT thing about the building statistics from various parts of the United States is the number of vocational schools being built either as separate structures or as additions to schools already in existence. A large number of these schools are providing for instruction in the different trades including plumbing and heating. The country seems to be finally awakening to the need of more skilled mechanics and to be making some provision for obtaining them and training them.

The fact is that there is a real and not imaginary shortage of mechanics which is making itself felt in the building industry and unless this condition is changed it is going to interfere seriously with the prosperity of the plumbing and heating business. A serious shortage of mechanics invariably results not only in abnormally high wages, but also in a decrease of output per man. High wages are a good thing for an industry where they are a reward for skilled, conscientious, and generally meritorious service and where there are no artificial restrictions keeping men from entering it, for in such cases high-grade, capable men are attracted to the industry. But often unscrupulous leaders take advantage of serious shortages in skilled tradesmen to encourage decreased production per man and raise wages to the point where the industry suffers because of the prohibitive cost to the public. The results of such conditions are usually a decided letting up in operations or the development of mechanical devices and other changes which cut down the amount of labor required to the minimum, and it also has a tendency at times to lower standards that it has required years of hard work to build up.

There is a long period of prosperity ahead for all branches of the building industry providing costs can be kept within reasonable bounds. There has been and still is a great shortage of mechanics, and some provision must be made for developing more if the contemplated building program for the next few years is to materialize, and four or five years is too long a period of preliminary training to help out in the present emergency. It is also too long for the young man of today to anticipate in learning a trade. It may have been the proper length of time years ago, but everything else has been speeded up during recent years and so must the training of mechanics. If vocational training schools can attract the young men with mechanical inclinations and by intensified preliminary training shorten the time for developing mechanics, they should be encouraged and every effort made to further their work. Or if there are better methods for securing the same results in the same or less time they should be put into effect at once. We need the mechanics.

THE BEST USE OF PROSPERITY.

IN a eulogy on Abraham Lincoln, Robert Ingersoll once said: "Nothing discloses real character like the use of power. It is easy for the weak to be gentle. Most people can bear adversity. But if you wish to know what a man really is, give him power. This is the supreme test." Today money is almost synonomous with power, and therefore we might paraphrase Mr. Ingersoll's statement and say that a man's use of money is a good indication of his character and ability. The past year has been a particularly active one for the building industry. There has been a great deal of business, and the plumbing and heating contractors have received their share of it. They have made considerable money, or in most cases had an opportunity to so. What have they done with it and what are they doing with it? Of course, some of the profits of the past year have gone to pay off losses sustained during the previous business depression, but many have cancelled those obligations long ago and with the increasing prosperity are building for the future. They are not spending their profits recklessly, but are entrenching themselves financially and are improving their machinery for getting and doing business. They are making their show windows and show rooms more attractive and arranging their shops to obtain the greatest efficiency and providing it with the best of equipment. They are installing modern accounting systems and putting the business generally on a firmer basis. They are building a reputation and developing the goodwill of the public, and they are learning to avoid business with highly questionable profitableness. In fact they are raising their standards, improving their methods and equipment, and in other ways laying the foundation for a bigger better business. That is the right way to utilize prosperity.

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Soon all the humor will be gone out of the "black diamond" jokes if the price of coal keeps climbing.

ENVELOPE STUFFERS *for* DEALERS

A Demand for More and Better Sales Help Folders, Aimed at the Consumer, to Enclose with Letters—Who Shall Furnish Them?

PULL up your chairs. Gather around the round table. Here is a subject that every plumbing, heating and ventilating manufacturer, jobber, salesman and dealer can discuss. It has already caused a deal of discussion. It will cause more. For, to quote the words of J. H. Borton, president of the Haines, Jones & Cadbury Co., Philadelphia, "it is a good idea, and it ought to be discussed at some of our trade gatherings, so as to get the point of view of many different men."

It is a good idea. Not exactly new, but good. On that point the vote is unanimous.

Small, attractive, interesting folders, to be read by customers and prospective customers, are the right kind of sales helps when used in the right way. This has been proved in many lines of business. And, in like manner, it has been proved in the fields of plumbing and heating as fast as the right sort of folders have appeared and as fast as they have been used as they should be used.

But what sort of folder is the right sort? And what is the right way to use the right sort of folder?

How the Agitation Started.

With these two questions in mind, and with others to follow, let us begin at the beginning and trace the subject down through the plumbing and heating industries. Out of this discussion will grow other discussions; out of other discussions will grow action; out of action will grow results.

This Illustrates R. T. Morrill's Idea: Keep a Live Mailing List of Past Sales and Future Needs, and Mail Out Folders Which Tell Customers and Prospects of the Things They Ought to Have. But be Careful to Bring to a Customer's Attention Only One Need at a Time.

A progressive plumbing and heating dealer started it. Name: Charles Fullman. Address: Portland, Oregan.

To know that he knows what he is talking about, be it known that he has been in business in Portland for twelve years. And during that time he has served as president of the Oregon State Master Plumbers' Association, treasurer of the same, vice-president of the Portland local association, and has been on the executive committee of the local association for nine years.

That is quite enough to entitle any man to a respectful hearing. But there is something more to add weight to his words. Before joining the plumbing and heating fraternity, Mr. Fullman did newspaper work. And so, coupled with his knowledge of plumbing and heating, is a knowledge of publicity. He has collected folders, studied them, sifted them. Out of long study he has arrived at certain conclusions.

The Kind of Folders Needed.

Summing up the situation, and placing the question of envelope stuffers squarely before the industries, Mr. Fullman submits for our attention and consideration the subject thus:

"I am trying to get manufacturers to print envelope stuffers of the right sort. Each folder, or stuffer, as I call it, should illustrate and describe but one article. For example, have one folder for a bath tub, another for a shower, a third for a water closet, for a water closet seat, double sink cock, bath cock, and so on. The printed matter in each folder should be so worded as to create desire on the part of the person receiving it. That is, the wording should be aimed straight at the consumer, and not at the plumber, as is now so often the case. And the folders should have the dealer's name and address printed on them."

The objection now is that, to begin with, many folders are written to interest the plumber instead of the prospective customer, and, to end with, these folders are imprinted with the jobber's name and address instead of that of the dealer.

"If a dealer mails a folder with a jobber's name on it," continues Mr. Fullman, "the prospective customer, should he want the thing the folder describes, is likely to call upon the jobber instead of upon the dealer. In such a case the jobber might sell the article direct, and, in so doing, credit some other dealer with the difference between the wholesale and the retail price. Or, on the other hand, the jobber might recommend the purchaser to employ any one of a half dozen plumbers or steam fitters to install the article. In either event, the dealer who created the desire, loses out, and maybe loses what would eventually be a valuable customer.

The Trouble With Many Folders.

"The trouble with many of the folders is this: They are written to convince and sell either the jobber or the dealer, and, because of this, the folders do not appeal to the housewife or the building owner." Then Mr. Fullman adds: "Heretofore it would seem that with many manufacturers the great aim was to sell the jobber, and the jobber's aim was to sell the dealer. Then the dealer was left to sell the consumer in any way that he could. From my correspondence I can see that the viewpoint is changing. Manufacturers, jobbers and dealers are partners in the education of the public, and in the sale of plumbing and heating goods. Therefore, each of the three should do his part in the building of business."

There, briefly put, is Mr. Fullman's envelope stuffer idea.

During the forty odd weeks that the Advertising Editorials have been running in "Domestic Engineering" the question

of envelope stuffers has bobbed up several times. Whether the Editorials suggested stuffers, or whether they revived an old desire, we do not know. But this much is certain: A number of dealers want and will use the kind of folders Mr. Fullman has outlined.

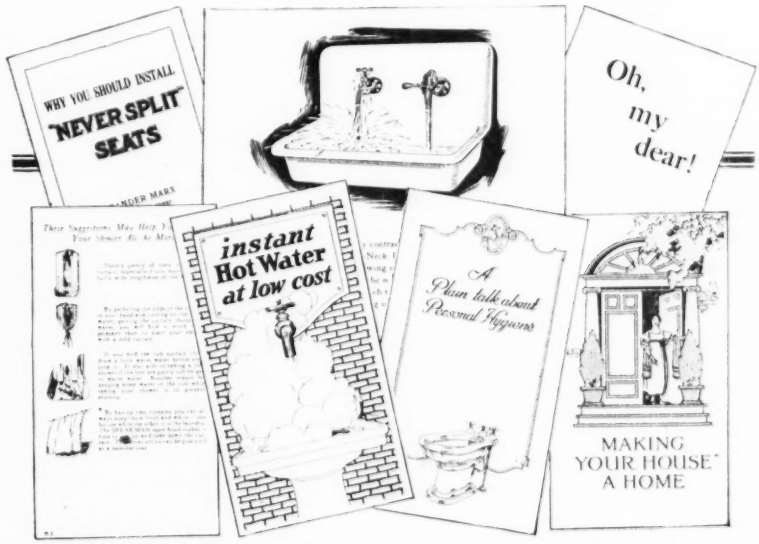
What Other Dealers Think.

After reading Mr. Fullman's letter, as well as letters from other dealers, "Domestic Engineering" set out to investigate the many-sided subject of envelope stuffers. The subject was placed before dealers, associations, jobbers and manufacturers. A volume of replies came back. All were interesting, and each writer tackled the subject with an earnestness that bespoke his sincere interest.

Continuing the dealer side of the subject, here are a few lines from R. T. Morrill, of Beloit, Wisconsin. Mr. Morrill is one of the newer type of merchandising plumbing and heating dealers. In about three years he has built a business that spells success in large letters.

Mr. Morrill says: "We are all hungry for live-wire folders of the size you suggest. Keeping track of your customer's needs, and putting in the envelope with your bill the folder that tells about that need in a thoroughly interesting way, builds up one's business. I have made a practice of this for some time, but I do not always have the folders necessary. For instance, a man has a bathroom in his home, but does not have a shower. If we send him a folder which tells about a whole complete bathroom, he may never read it. But send him one which tells about a shower only, and he is sure to be interested."

Isn't that a good point? And, O, ye ad-men, doesn't that follow the advertising principle that should be followed?


WHY YOU SHOULD INSTALL
"NEVER SPLIT" SEATS
Oh, my dear!
instant Hot Water at low cost
A Plain talk about Personal Hygiene
MAKING YOUR HOUSE A HOME

A Few of the Folders That Have Been Passed by Dealers as Being About the Kind That Is Wanted. Reading from Left to Right, and Beginning at the Top, the Folders Represent the Never Split Seat Co., Thomas Savill's Sons, The Chicago Faucet Co., Speakman Company, American Heater Corporation, Thomas Maddock's Sons Co., Ruud Manufacturing Co.

"One thing I have noticed," Mr. Morrill goes on to say, "is that a folder with a page of snappy, to-the-point history about plumbing is nearly always read. But a page, or, at most, two, is plenty." And then, just for good measure, he adds this: "I hope you are successful in this work of envelope stuffers. For it will help to modernize the home before the automobile salesman sells them the car and we get the door."

A Slightly Different Angle.

W. C. Green differs with Mr. Morrill regarding the enclosure of folders with bills and statements. Mr. Green is general secretary of the Society of Sanitary and Heating Engineers, Kansas City, Mo. And picking up one of Mr. Morrill's points, which is also one of Mr. Fullman's points, he gives it a different slant, thus: "I think an enclosure of one of these folders in a letter to a customer, together with a bill rendered, would not be the best way."

Mr. Green believes that seasonable folders in letters to customers and prospective customers, who owe nothing, would be much better.

The seasonable folder, as well as folders for the various campaigns, as designated by The National Trade Extension Bureau, is always good. A seasonable folder hits hard, that's true, because it hits at the psychological time. But Mr. Morrill's idea of keeping track of the needs of customers is also psychological. To do this a dealer must maintain a mailing list, and that list must be a record of both past sales and future needs. This will take work, but it will pay.

An Important Point.

Speaking of mailing lists brings Mr. Green to another point. "In my opinion," says he, "only dealers who maintain live mailing lists should be furnished with the proposed folders. It would not do for manufacturers or jobbers to furnish folders to all dealers who handle their goods. To do so would mean much waste. For, in my experience, only a certain percentage of plumbers and fitters will use folders as they should. Therefore," continues Mr. Green, "I suggest that manufacturers or jobbers demand some requirement —some positive assurance—that the folders they furnish shall be used in the proper way."

In that suggestion Mr. Green strikes at the foundation of all folder distribution. Throughout the years, and throughout all industries, the great problem of manufacturers and jobbers has been to devise a plan whereby dealers would make use of folders, and other sales helps, in a systematic and profitable way. Some manufacturers have demanded an assurance in the form of a small payment for folders. Others have tied up the folders with sales contracts. A few have left the question of supplying dealers with folders to their traveling salesmen.

Mr. Green thinks the folder idea "is one of the best." And he also thinks "the educational and advertising possibilities of the idea, at a minimum cost, are very great."

This live secretary makes two other suggestions—one for the dealers and one for the manufacturers. He suggests that dealers get the Trade Extension Bureau to help them in compiling mailing lists. And then he suggests that manufacturers standardize the folders, and announce in all their advertising, "Folders issued to dealers who maintain live mailing lists."

Limit the Reading Matter.

Wm. G, Bergner, head of the Bergner Plumbing, Heating and Supply Company, at Granite City, Ill., who mails folders with letters, bills and so forth, contributes a worth while suggestion. "The stuffers should be printed in colors," he says, "and with good illustrations, and with a limited amount of reading matter. I believe that many of the stuffers now sent out contain too much reading matter and are printed in type that is too small."

To make an impression on the public mind, a folder must first attract and then interest. Unless it is both attractive and interesting it will fail to create the desired effect.

Leander Marx, of New Orleans, who is always working for the betterment of everything associated with plumbing and heating, approves Mr. Fullman's idea "most heartily."

"Push the idea along," writes Arthur D. Baum, a leader

in the business life of Kirksville, Mo. "We never let a bill go out of our office without including a folder of some kind in the envelope," he says.

Mr. Baum is as full of ideas as a timid bather on a cold day is full of goose pimples. Listen to him: "The best results would be obtained with a regular mailing list. Then use this list to mail a new folder, containing a new idea, every month. Have a definite date for mailing—the 10th or the 15th. Be regular, systematic—that's what counts.

Ridding the Public of False Ideas.

"These folders could run with the seasons. That is to say, each month should bring to customers and prospects a certain message. Each dealer should make up a mailing list, and should order a sufficient number of folders to take care of that list. The folders should reach him by the first of each month. Suppose, for example, such a program could be started with January, 1923, and could be continued from month to month throughout the 'skidoo' (23) year, what would happen? Why, many of the false ideas that are now in the public mind would 'skiddoo'."

In his next statement Mr. Baum wanders slightly from the subject of folders. Or does he? Well, anyway, his point is worth printing, for it has to do with the education of the public. And isn't education the heart of folder circulation?

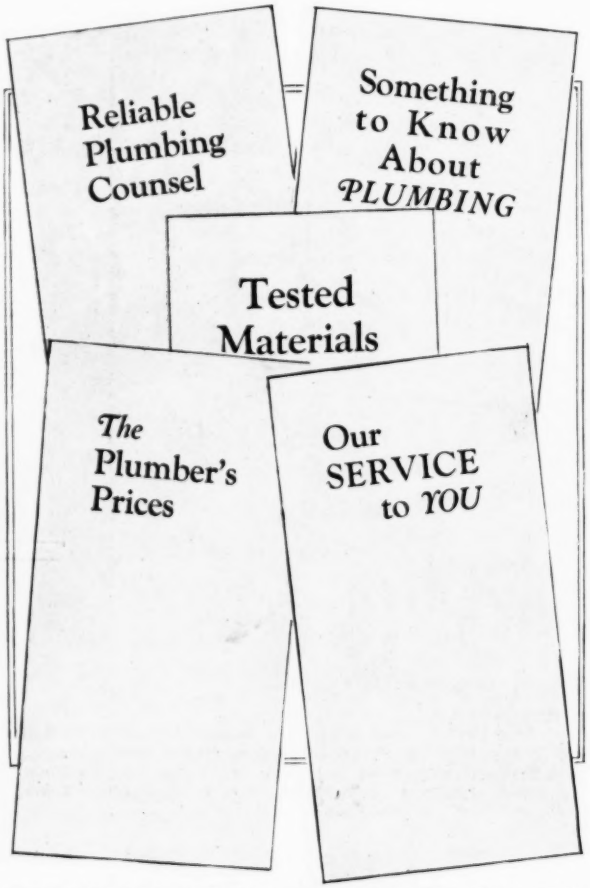
Mr. Baum goes on to say: "The importance of good plumbing installation, by a reliable, well-established dealer, would be of great value to the rural district and small towns. Although our little city has 10,000 people, we have no plumbing ordinance. Consequently every Tom, Dick and Harry can install plumbing any old way he wants to."

Then he says this: "I have advocated a universal state law, with county inspectorship, for all districts outside the big cities. But, in talking with our county representative, he told me that every time a plumbing bill comes up in the legislature, everybody laughs and considers it a joke." Isn't that a fact? Missouri is not the only "show-me" state.

"But," concludes Mr. Baum, "an educational campaign, such as could be carried on with folders and other things, would do wonders for the public. And then, too, such a campaign would educate some of our plumbers to appreciate the fact that the plumbing profession is not a joke."

Now the Jobbers Come to Bat.

And so, with that, as they say in legal proceedings, the dealers rest their case. But, it must be understood, they reserve the right to submit further evidence at any time before the question of folders is finally settled.



This Series is Out of Print, or, at Any Rate, Quantities are Not to be Had. These Folders Were Formerly Issued by the Kohler Co., and are a Fine Type of the Class That Educates the Public. They are Different from the Other Group of Folders, and They Go About Selling Through Education. "We Agree That There is Merit in the Folder Idea and See No Reason Why it Should Not be Put in Force," Writes L. L. Smith, the Kohler Advertising Manager.

Now we turn to the jobbers. They speak as one in endorsing Mr. Fullman's idea. There is no doubt in the minds of the jobbers, who have thus far expressed themselves, that the right kind of folders, rightly distributed, would be of large and lasting business benefit. But they raise a question, the jobbers do. "Who shall furnish the folders to the dealers?" That is the question.

And the answers are as varied as were the colors of—of what's-his-name's coat.

For example, W. J. Hepburn, manager of the Seashore Supply Company, at Atlantic City, believes "the manufacturers should furnish these folders, sending them to the various jobbers for imprinting and distribution to the dealers."

A. W. Buschmann, of August Buschmann & Sons, Indianapolis, thinks the same, "except where jobbers have the exclusive sale of an article." L. C. Huesmann, president of the Central Supply Company, also of Indianapolis, thinks a good plan would be for "Domestic Engineering" to "publish these folders, making them very attractive, and sell them to the jobbers for distribution."

Who Shall Prepare the Folders?

E. C. Garrity, president of the National Plumbing & Heating Supply Co., Chicago, and also the present president of the Central Supply Association, has a different idea. He feels that such folders would result in more business; "but," he says, "I am firmly in the belief that this work should be done by the Trade Extension Bureau, who are collecting funds for just such purposes."

Paul Blatchford, secretary of the Central Supply Association, agrees with many others that it "is directly in the province of the manufacturers to supply the folders to their jobbers, either through the several manufacturers' associations or the manufacturers as individuals." Or — and in this Mr. Blatchford seconds the idea of Mr. Garrity—"there is just one other thought in this connection. And that is, whether with their facilities, and knowing the mind of the plumbing and heating contractors, The National Trade Extension Bureau might not be able to get up something good along these lines. Their charges, I know, would be moderate, and as they are in close touch with both the manufacturers and jobbers, perhaps they could undertake the work."

H. S. Chamberlin, sales manager for Harper & Reynolds, of Los Angeles, strikes an optimistic note when he says: "We find that most manufacturers are only too glad to furnish such folders. The opportunity of putting their advertising directly into the hands of distributors and con-

sumers is much more effective than promiscuous broadcasting."

Make a Small Charge for Folders.

Geo. H. Laib, president of the Laib Co., of Louisville, is one who thinks the folders would be a good job for the Trade Extension Bureau. And, in this connection, he touches a most important point in the distribution of dealer helps. "These folders could then be furnished at a nominal price," says Mr. Laib, still having in mind the Trade Extension Bureau, "for we don't believe in giving them gratis."

In advertising and selling circles it is generally agreed that a price adds value to a folder. The price may be very small—next to nothing, as the saying is—but if a dealer pays something, he is pretty apt to order only the number he can use, and then he is just as apt to make use of that number. At any rate it is well to attach to the folders some sort of "positive assurance," to again use the words of W. C. Green, of Kansas City.

As the Manufacturers See It.

The manufacturers, who should come first, have been left to the last. And what do they say? They say many things. They are interested; they believe Mr. Fullman's idea is worth thinking about; some manufacturers have printed just the sort of folders that are now being discussed; others may print this sort; a few think the jobbers should do it to help their trade; quite a number hold that the Trade Extension Bureau should print folders, particularly of a general educational character; a less number suggest that "Domestic Engineering" prepare and sell folders in much the same way that it prepares and sells Bath a Day helps.

Talk about varied opinions. They are more varied than were the colors of Jacob's coat, if Jacob was the name of the man who had the many-colored coat.

Going back to J. H. Borton, president of Haines, Jones & Cadbury Co., who do both manufacturing and jobbing, and with whom, you remember, we started this discussion, we learn this: "We have been furnishing folders to our customers for several years. We do not do it indiscriminately, but only to such people as we believe will use them.

"We believe the idea is an excellent one, and plumbers who have tried it tell us that it brings them business.

"Now as to who should furnish the folders, that, of course, depends entirely on circumstances. There are some manufacturers, I presume, who would be very glad to furnish their jobbers these folders to send out to the jobbers' trade. On the other hand, there are probably some jobbers who would want to get up their own folders and send them out to the trade, as they probably sell their goods under their own trade name.

"I can readily believe," concludes Mr. Borton, "that suitable folders might be an excellent thing for the industry, and might stimulate our trade very much indeed."

The Ruud Manufacturing Co., through its good ad-man, M. M. Scott, of Pittsburgh, says it has been furnishing folders to dealers for the past twenty years. And Mr. Scott gives vent to his enthusiasm for this kind of service when he says, "bear down with emphasis on the fact that practically all manufacturers are ready to furnish a high grade line of literature, and that dealers who do not use it are passing up real money."

Passing it up? They're blindly stumbling over it.

How Far Can We Go?

For the last two years the Speakman Company, of Wilmington, Delaware, has been, in a limited way, offering to supply folders to dealers. "There is no doubt that the plumbers appreciate this service," writes A. V. Gemmill, the secretary, "but, the point is, how far can it be carried at the manufacturer's expense?"

Here is Reproduced the "House Party" Blotter, Mentioned by A. V. Gemmill, Secretary of the Speakman Company, and Which He Uses to Illustrate the Idea of Making a Small Charge for Folders.

That, as has been said, is the question. But, thanks to the experience of the Speakman Company, Mr. Gemmill is able to illuminate the question with a few rays of light.

"As evidence that plumbers are anxious to avail themselves of service of this kind," to further quote the Speakman secretary, "we refer to our experience in offering our 'House Party' blotter. We first sent out this blotter, offering to furnish a few extra copies to any one that might be interested. The number of requests we received surprised us. In fact, the quantity requested ran so high that we found we were going to have a bigger job on our hands than we anticipated."

Then Mr. Gemmill mentions the charge idea and its results. "We, therefore," he says, "sent a few blotters to each one who sent in a request, and, at the same time, offered to furnish a larger quantity, with their name printed on them, at cost. We did not urge any one to order the blotters on this basis, but simply offered the opportunity. The response was very satisfactory. It seems to us that the matter of folders, properly prepared, could be handled along the same lines."

Very Effective Advertising.

The Chicago Faucet Company is an enthusiastic user of envelope stuffers, written to appeal to the consumer. And E. E. Brown, secretary of that company, believes it is a good practice for dealers to enclose a folder with each bill

or statement. The American Heater Corporation believes the same. For, as the sales manager, H. C. Tabler, puts it, "we have found this method of advertising very effective, and are just now printing a series of three new folders, designed for the use of the dealer in reaching his customers and prospects."

Many manufacturers, as well as dealers, have been thinking over the folder idea for a good long time. It is a question that is not easy to settle. For instance, W. K. Glenn, manager of the advertising department of Crane Co., says: "The question of furnishing plumbers nationally with a circular covering each item which we manufacture, and which is of interest to them, is a rather large undertaking. The expense would be enormous. We are studying the question, however, but up to the present time have not solved it."

Anxious to Discuss the Matter.

The Sanitary Company of America says that up to this time it has not received requests from plumbers for folders which they can send out to the public. But, writes B. W. Frederick, secretary of that company, "we are of course, at all times, willing and anxious to advertise our line of material to the user, as well as to the plumber and the jobber." So, Mr. Frederick awaits the discussion with interest. And so does Leonard Rausch, Jr., of the Philip Haas Company, for the reason that this company has not as yet issued folders to be read by the general public only. However, swinging to the other side of the problem, we find that the Thomas Maddock's Sons Co. has long made a practice of printing folders which appeal directly to the prospective buyer. "And," says O. Riegel, the Maddock's ad-man, "we are very glad to furnish plumbers with a quantity of such folders imprinted with their name and address." In a like manner, writes E. F. Niedecken, of Hoffmann & Billings Mfg. Co., "we furnish envelope stuffers, with their names imprinted, to contracting plumbers when asked for."

And so might the discussion be continued. As a matter of fact, the discussion will be continued—with dealers, jobbers and manufacturers. These pages have done little more than scratch the surface of a large and important advertising and selling subject.

It has been suggested that a committee be appointed to work out the fundamental principles of a folder that should appeal to the public. This might be a good way in which to solve the folder question. What do you think?

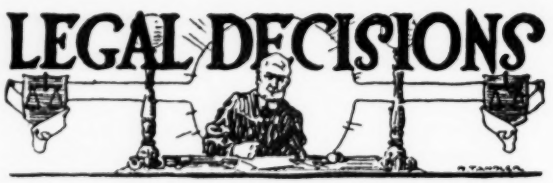
SOUTH SPENDS EIGHTY-EIGHT MILLION ON SCHOOLS.

Of the fourteen largest cities in the Southeast, eleven reported during August an increase in construction as compared with the August of 1921, Atlanta leading with almost $2,000,000 worth of new building announced during the month, which compares with little more than half a million during August a year ago.

More than 700 new school buildings have been, or are being, constructed in the South so far this year, entailing a total investment of over $88,000,000.

The plumbing and heating industries of the section naturally are feeling the favorable effects of this construction activity, and business generally is better than it has been at any time since the inflation period immediately following the war. The strike is having comparatively little effect on the contract business, save that it is holding up deliveries to some extent of pipe, boilers and radiation equipment.

Atlanta headquarters of the Southern Metal Trades Association advises that the plants in the South manufacturing pipe, boilers and other supplies used by the plumbing and heating trades, have been unusually active the past two or three months with production steadily upward, though the strike is beginning to result in a shortage of materials that may presently cause a slight curtailment.



Plumber Failing to Perform Contract or Removing Part of Fixtures.

The Supreme Court of Mississippi, Division A, holds that one who contracts to furnish the materials for and perform the labor necessary to complete a plumbing job in a residence for a fixed sum cannot abandon the work and recover on a quantum meruit, or what it is worth, for such a contract is an entirety and cannot be apportioned, and no recovery can be had thereon by the party guilty of its breach; he cannot recover on the contract because he has failed to perform it, nor can he recover upon a quantum meruit because of the existence of the contract.

And that principle of law applies to such a contract where the plumber has completed the job according to contract, which has been accepted by the owner of the residence; and where, upon default by the latter in the payment of the contract price, the plumber without the consent of the owner of such residence goes therein and tears out and takes away and appropriates to his own use a large part of said fixtures, and then sues such owner of the residence on the contract for the contract price; under such facts said plumber's attitude is as if he had never completed said contract. He must stand on his contract and the remedy of force adopted by him for its enforcement.

The court says (91 Southern Reporter, 703) that it believes the authorities are unanimous in holding that a contract of this character is an entirety, and cannot be apportioned, and that no recovery thereon can be had by the party guilty of its breach. He cannot recover on the contract itself because he has failed to perform it, nor can he recover upon a quantum meruit because of the existence of the contract. One who contracts to furnish materials and do labor for a fixed sum cannot abandon the work and recover for the labor performed and materials furnished.

It was true that the contract in question had been completed by the plumber, and he was entitled to the contract price up to the time he took the law in his own hands and went into the residence and tore out and took away part of the fixtures he had installed. But when he did that it amounted to undoing what he had theretofore completed. In other words, after the plumber had removed the larger part of the fixtures in the manner stated, the contract was incomplete so far as he was concerned. The fact that the owner of the residence was in default in making payment for the work done and materials furnished did not give the plumber license to do what he did. He had his remedy under the law, and should have pursued it. He adopted instead the might of his own good right arm, and, wherein that remedy failed him, he must stand the loss. This was a case where the plumber must stand on his contract, as well as on the remedy for its enforcement first adopted by him. If these have proven inadequate, he had no one to blame but himself. It followed from these views that the trial court erred in directing a verdict for the plumber.

Not Entitled to Use Firm Name.

Where, on dissolution of a partnership, and the purchase by one of the partners of the firm property and good will, the partners stipulate that neither shall thereafter advertise as successors of the firm, the purchaser of the good will may be enjoined from using such firm name in a telephone directory. If neither could advertise as successor to the old firm, neither could assume to be the old firm.—Supreme Court of Minnesota, in Strand v. Strand et al., 188 Northwestern Reporter, 568.

PROBLEMS *in* HOT WATER HEATING

An Answer to the Inquiry of K. B. Ayers, Akron, Ohio

IN order to experience the comfort and satisfaction to be reasonably expected from the use of a modern heating system it is essential that the apparatus should be carefully planned and installed. Except the heating apparatus functions properly it is a source of much trouble and inconvenience, to say nothing of the waste of fuel and conditions contributing to ill-health.

The above statement is particularly true of a hot water heating system, and we venture the opinion that there is more waste of fuel, inefficient heating, and personal discomfort experienced, due to poorly designed and installed hot water systems, than from those of any other character; yet, this method of heating is commonly considered the most simple and easiest to install of any of the more modern heating systems.

We are frequently in receipt of letters, addressed to the Questions and Answers Department of "Domestic Engineering," that lead us to believe there are still many of the heating trade that are more or less unfamiliar with many of the more important details to be considered when planning the installation of a hot water heating system.

The following letter, a most interesting inquiry, received a short time ago, affords a most excellent opportunity for the discussion of some of the more important problems of estimating and planning, and details of installation, of a modern hot water heating system. Much of the matter contained in the letter has no particular bearing on the installation details of the job. However, we publish it in full, as some of the writers' references to the attitude of the heating men of his city, and his deductions derived from their recommendations, are highly illuminating:

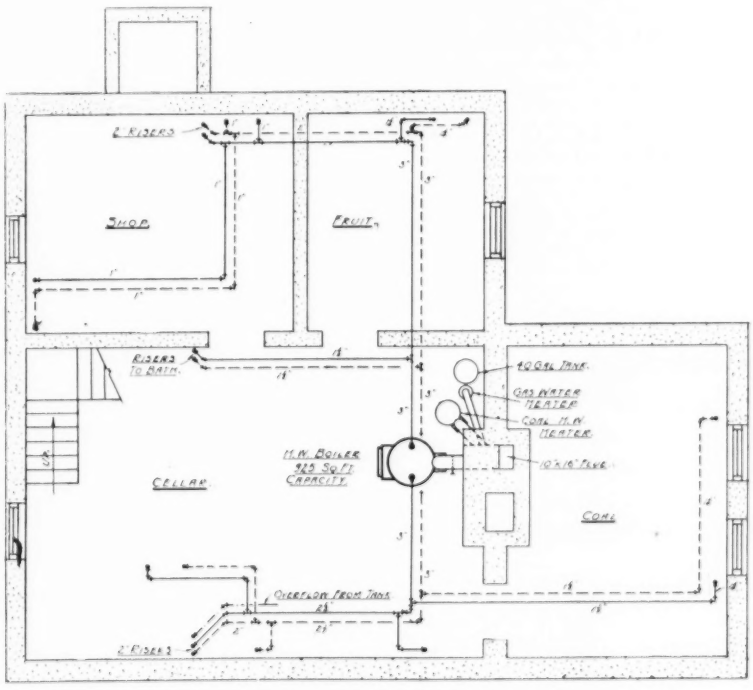


Fig. 1.

Mr. Ayers' Letter.

The several sketches submitted by correspondent show the floor plans of the basement, first, second and third floors of his residence, on which the position and size of the radiators, the piping system, and other details, are shown. These sketches we have reproduced for publication following the details given as closely as possible. Figs. 1, 2, 3 and 4, respectively, illustrate the basement, first, second and attic floors.

It may be well to state in the beginning that, after a careful reading of correspondent's letter and examination of the sketches submitted, it is apparent that the amount of radiation installed is inadequate, the boiler too small, and the piping system poorly designed. In discussing details we shall endeavor to show the more serious of the errors that have been made.

Domestic Engineering,
Chicago, Ill.
Dear Gentlemen:

I am considering making some changes in my hot water heating system at my residence, and, before I let the steamfitter touch it, I would like to go over the entire ground with you and secure your advice.

I am writing direct to you because I have seen five firms in my city who are responsible, and any one of them would be termed reliable. But, when one tells me that I need to get a perfect working heating plant, and this is diametrically opposed by the advice of others, I appeal to you.

The trouble was that one advocated a new larger-size boiler and he was anxious to sell it. The other, having a surplus of radiators, advised changing radiators and change the present boiler to a vapor system. Others advised basement expansion tank and closed pressure system. The gist of their recommendations was along the lines of their weak spots in their respective businesses. I saw a heating engineer who is well versed in industrial heating and ventilating systems. He said that he did not specialize in hot water systems well enough to give a real recommendation, but advised me to see a certain plumber and to mention his name to him. (A sort of commission coming to him if this plumber gets the job, or so it looked to me.)

I have my own ideas what I really need, and I thought that if I write to you, as an editor of a plumbing and heating journal, whatever you have to say in this case would make a very interesting reading matter for these plumbers.

The boiler is round, made up of four sections, has a 23-inch grate, and is rated by the manufacturer at 925 sq. ft. for hot water heating. It has a 9-inch chimney outlet. The boiler is regulated from a thermostat in the living room, set for 70 degrees in the day time and 60 in the night for seven-hour firing period.

The mains in the cellar from and to the boiler have almost no pitch at all. This may not be very objectionable as far as the installation is concerned, but if it causes a sluggish circulation in the system then the pitch will have to be reckoned with.

The main defect in the system is this:

With a temperature difference of only 50 degrees from

inside and outside, it requires the boiler temperature around 230 to 240 to heat the house to 70 degrees, and that called for an unnecessary forced firing. My coal requirements were 16 tons of hard coal the first winter, and then 15 tons the second winter, after insulating the boiler and mains with 85 per cent magnesia coverings. This past winter I decided to use the Pocahontas coal, which had a higher heating value and much less ash. This coal gives more satisfaction than the hard coal, but still it took 15 tons last winter. Then I decided that there was something rotten in the system somewhere.

Some radiators are certainly rated too small for their respective rooms, especially when a strong wind is around.

There is not enough margin of boiler capacity over that of the radiation plus pipings and an excess overloading demand. A new boiler of proper capacity and excellent fuel consuming sections or waterway, rated for longer firing periods, will probably give me the desired improvement.

Marked sluggish circulation of radiators in several instances are noted.

Some radiators got more circulation than others and the one in the bath room was the hottest. This is to be expected because of the excellent riser and return it has, being alone all the way from the cellar mains. The attic radiators are very good, and in fact they heat the room up there pretty well, even though somewhat underrated for the size of the room.

I tried a weight safety valve set to release at 10 lbs. above the normal overhead pressure in the boiler at the exit of the expansion tank Z, marked "A" in the sketch, to act as a circulator generator, or, in other words, to render the system under increased pressure. While the slightly increased pressure seemed to improve, it did not help the matter much as far as the firing problem was concerned. I said "seemed to improve," which was probably all an imagination, because the boiler still had to go way up high as to the water temperature, and it did not take it any longer to have the thermostat close the dampers down, it was a case of very little if any difference between open and closed system. So the system is at present running on open again, waiting for a proper remedy.

Then I turned to the chimney itself, fearing that it may not have sufficient draft or capacity to draw the boiler. I found that the fact that I have the gas heater and a small coal heater hooked to the same flue would cause trouble.

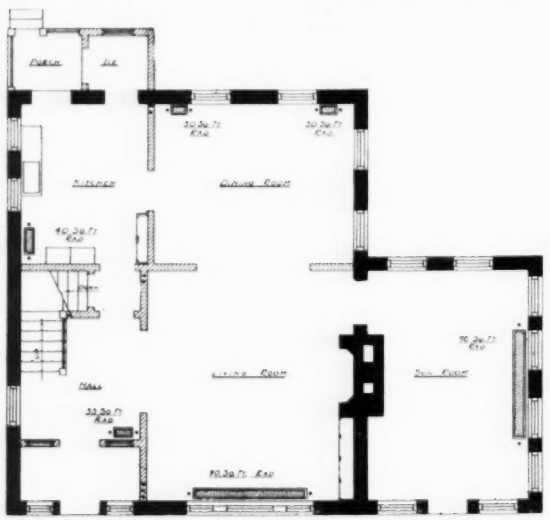


Fig. 2.

The fact is that the gas heater and coal heater are disconnected when the boiler is in use, and that the holes for these vents are plugged up absolutely tight with magnesia cement. The boiler had the flue all to itself. When the chimney is hot the draft is exceptionally strong, and after being checked it has a tendency to cool down too rapidly. Probably a question of keeping the draft check damper closed in order not to cool the chimney.

The strong windy days would make the front bed rooms too cold, and the hall downstairs very drafty, even though all windows are weatherstripped with metal strips.

The expansion tank has not enough overhead distance from the top radiator, being only 18 inches above. This cannot

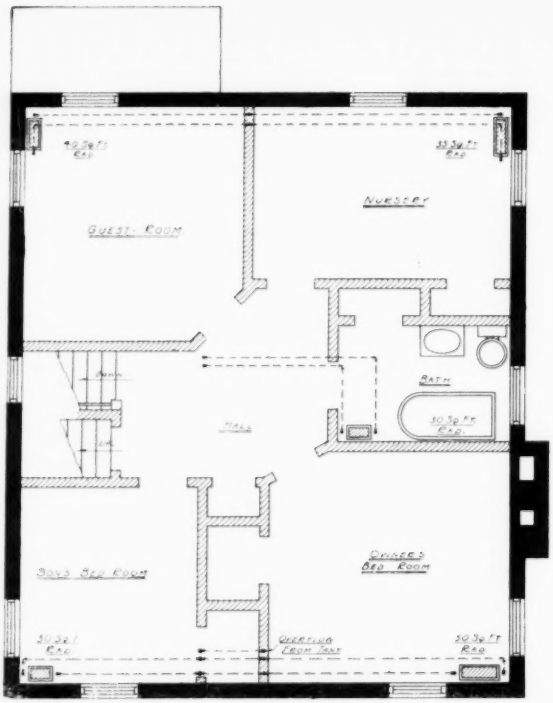


Fig. 3.

be helped, due to the limitations of the roof. Still this apparently insufficient overhead does not seem to amount to anything so long as the two radiators on the third floor are securing a very good circulation and exceptionally free from air pockets. The whole house system is exceptionally free from air pockets in the pipings or in the radiators. The fact that the air pockets do not collect seems to make the mains in cellar, which has no pitch, not a very bad factor; but it is believed that if there is a pitch, say 1 inch per 8 to 10 feet, may improve materially as far as the circulation is concerned.

I will summarize the effects of each radiator when the water in boiler is at 200 and the weather is around freezing point Z (33-34), and after running the boiler for four hours from the time the thermostat opened the ash door damper and the water at the start was around 140.

Living Room.—Getting warm but not 70 yet.

Sun Room.—Getting satisfactory rise in temperature.

Dining Room.—Very warm if all doors are closed; otherwise, not very well heated.

Kitchen.—Poor heat in radiator, very cool and gets help from opening the dining room door. Probably due to poor pitch and too large valve area (1 inch) on riser and return.

Hall.—Marked insufficient radiation and very sluggish circulation. This is probably because the water, when hot, seeks the vertical riser to attic and does not branch into this radiator very well.

Owner's Bed Room.—All right if no wind, otherwise it is beyond fixing, as the temperature in this room would be about 10 degrees above the outdoor temperature.

Son's Bed Room.—Same conditions as owner's.

Guest Room.—Satisfactory, but can be better with about 20 sq. ft. extra radiation.

Nursery Room.—Very satisfactory in all kinds of weather.

Bathroom.—Overheated all the time if valve is wide open.

Attic.—Satisfactory when not occupied, and a little uncomfortable when occupied, due to insufficient radiation in the 29 ft. radiator.

The sketches and the above diagnosis may be self-explanatory, and it is understood that the boiler is not allowed to have soot deposition at all.

What do you suggest for the proper remedy in this case?

Will not changing to vapor system be too warm on account of too large radiation for steam requirements with the present radiators?

All radiators have bottom inlets and outlets.

My idea of remedy is to get a boiler of about 1,700 ft. rating, with excellent fuel line in its sections, and to add 5 to 8 ft. on top of chimney, and to use somewhat smaller

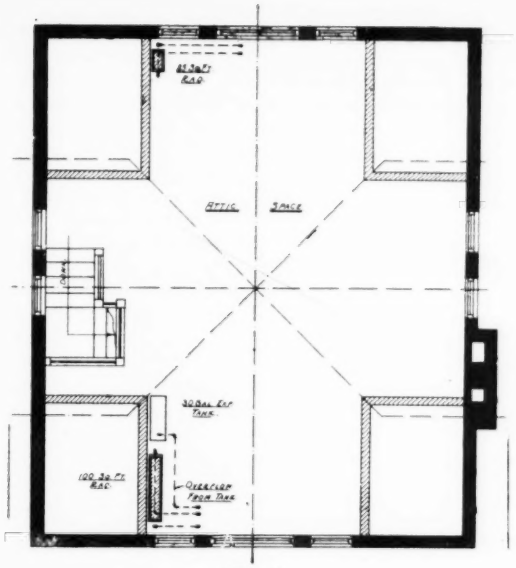


Fig. 4.

mains, 2½-inch, instead of 3-inch, etc., sharp pitch from and to boiler, and a regulator to control dampers by the temperature of water instead of the thermostat, as the lag of room temperature is too slow and too long. And put the entire system under a sufficient pressure to do good work, about 10 in. excess of the overhead hydrostatic pressure. Entire outfit to be well insulated in cellar, with asbestos covering about 1 inch thick on piping and 2 inches on boiler itself. Fuel to be hard coal eggs or Pocahontas eggs.

Thanking you in advance for any suggestions that you may care to make. B. K. Ayers.

* * *

Estimating, from the data and sketches submitted, would indicate that practically 775 sq. ft. of radiation is required to warm the rooms to a uniform temperature of 70 degrees in zero weather, whereas only 631 sq. ft. is at the present time installed. The estimated radiation is divided as follows: Hall, 55 ft., Living Room, 90 ft., Sun Room, 96 ft., Dining Room, 80 ft., Kitchen, 55 ft., Owner's Bed Room, 65 ft., Son's Bed Room, 55 ft., Bath Room, 30 ft., Guest's Room, 55 ft., Nursery, 45 ft., and Attic two radiators of 100 ft. and 45 ft., respectively. While the figured radiation differs slightly from that now installed in the Living Room, Sun Room and Bath Room, we have made no change, as correspondent states that these rooms are now satisfactorily heated. To the amount of radiation now in the Dining Room we add 20 sq. ft. and to the Nursery 10 sq. ft. in order to warm these two rooms to a satisfactory degree with lower water temperatures. By lower water temperatures is meant possibly from 175 degrees to 180 degrees in average cold weather.

While every hot water system is improved by the addition of accelerating devices, which tend to quicken and strengthen the circulation, we do not deem it wise to attempt to carry excessively high pressures and temperatures, even though it is possible to do so. The reserve power, provided by the use of the accelerating device, is an asset for quick use in the event of a very sudden drop in the outside temperature or the required quick warming of the residence after it has been allowed to cool owing to the enforced absence of the family. This latter condition, however, is seldom met with when the system is regulated by an automatic temperature regulating device. The location of the radiators, as shown by sketches, is uniformly very good. There is an insufficiency of radiation in the rooms on the most exposed or windward side of the building.

The Size of Boiler.

Boiler capacity for the amount of radiation required to properly warm the building, making the usual 50 per cent allowance for reserve and safety, should be figured at 1,200 sq. ft. A boiler of this capacity is none too large for satisfactory and economical service.

When an engineer, or expert heating man, is called upon to examine a sick job of heating, one of the first movements is to carefully examine the chimney flue to see that it has the area and height required for the work demanded of it. The smoke flue is the breathing apparatus of the system, and unless it is adequate the system cannot function properly. An examination of this chimney, judging from the sketches submitted and the notes on same, shows that it is adequate in both height (38 ft. from boiler to the top) and area for the work demanded of it.

Having now considered three of the principle factors of the work—the radiation, the boiler and the chimney—let us examine the piping system. If there is any difference in the importance of any particular features of the work we should say that the proper sizing of the piping, and method of connecting the various branches and radiators, is the most important detail of hot water heating. The importance of this detail is so great as to warrant the most careful thought and calculation.

The ideal system of hot water heating is one that provides in the piping system for a balanced circulation, which is to say, a system so designed that the hot water will be equally distributed throughout the entire apparatus. Those fitters who size their piping according to a rule recommending a certain size of main to supply a certain footage of radiation are using a "Rule-of-thumb" method that is both unsatisfactory and expensive.

The Piping Layout.

Taking the piping layout shown on Fig. 1, for example, we see that two 3-inch mains are provided to supply 631 sq. ft. of radiation. For an open tank gravity hot water system various authorities suggest that a 3-inch main will supply from 400 to 800 sq. ft. An average of these recommendations would be about 600 sq. ft., which amount is substantially

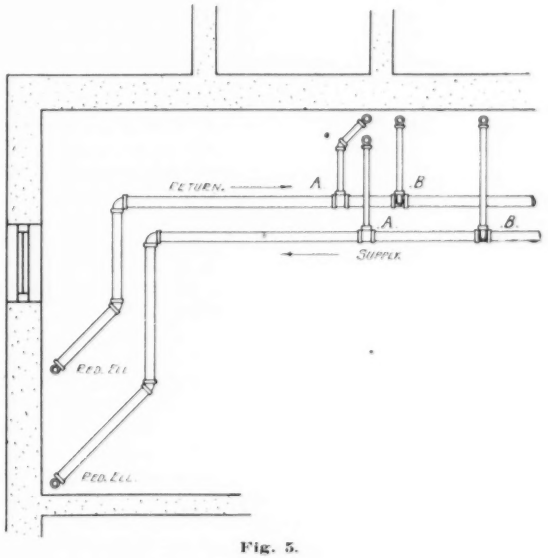


Fig. 5.

correct for mains less than 100 feet in length. If the 631 sq. ft. were divided equally between each main we have a 3-inch pipe supplying about 315 sq. ft. This method, however, leaves so much to the judgment of the fitter that, except he be well versed in hot water heating practice, he is practically sure to make a failure of the work or to install a system which is more or less water-logged. Assuming that this job is to be installed as an accelerated system, or a system operated under a slight pressure in excess of that

due to the height of the water in the same, the use of the valve sizes following is considered good practice, and the valve sizes or valve area supplied should be the basis upon which the size of the mains is calculated, as we shall explain more fully later on.

For Radiators Located on First Floor:

20 sq. ft., or less.....½-inch valve
25 to 50 sq. ft.....¾-inch valve
50 to 125 sq. ft..... 1-inch valve

For Radiators Located on Second Floor:

30 sq. ft., or less.....½-inch valve
30 to 100 sq. ft.....¾-inch valve
Over 100 sq. ft..... 1-inch valve

For Radiators Located on Third (or upper) Floor:

40 sq. ft., or less.....½-inch valve
Over 40 sq. ft.....¾-inch valve

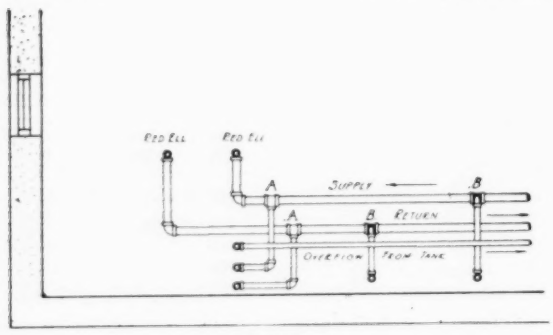


Fig. 6.

An Important Point.

With radiator valves properly sized for the work required there is one rule that will always hold good. **The area of a main should always equal or slightly exceed the area of all valves supplied by it.** Also, each main should end at the connection to a first floor radiator and it should be two pipe sizes larger than the connection to this radiator. One of the reasons for the sluggish circulation to the radiators in kitchen and hall is due to the fact that the piping at the end of the mains is not properly connected. Note by the illustration, Fig. 5, showing the connection to the kitchen radiator and to the risers, the manner in which this work should be installed. Also, note by Fig. 6 the manner of connecting the hall radiator at the end of the main, and also the connection to the risers.

Assuming that the amount of radiation recommended has been installed, we may now consider the size of valves, risers, mains, etc. In making our calculations we will use circle area for both piping and valves although pipe areas (commercial sizes) differ somewhat from the area of a circle of the same size. To properly size the piping it is necessary to begin with the radiator connections at the end of each main. The hall radiator, being at the end of the main, should have a 1-inch valve. Going under the radiator with a pipe two sizes larger than the radiator connection requires that the main should end 1½ inches in size, having an area of 1.75 sq. in. The riser near the end of this main supplies the owner's bed room, the son's bed room, both on the second floor, and the 100 sq. ft. radiator in the attic. The riser from the second floor to the attic radiator should be ¾-inch, the same size as the valve on this radiator. The connection and valve to the radiator in owner's bed room should be ¾-inch; likewise to the radiator in the son's bed room. The area of a ¾-inch pipe being .44 sq. in. the three radiators total .44×3 or 1.32 sq. in. Owing to this fact, and to the long reaches from riser to the radiators on the second floor it is well to make this riser 1½-inch in size, the area of the 1½-inch pipe being 1.76 sq. in. A condition is now created which requires that this main should end 2 inches in size.

In good piping practice it is not well to take the branch for a riser from the main by a connection from the top. It is also a poor plan to reduce the size of a main at a point where the branch connection is not taken from the top, on account of creating an air pocket, which will interfere with the circulation. Owing to these facts the main should be 2-inch at the end and the connection to the hall radiator should be made with 2x¾-inch elbows. The connection to the riser, marked A on Fig. 6, should be taken from the side of the main, or preferably from the bottom with a 45-degree connection. The 2-inch main, area 3.14 sq. in., is ample to care for both of the connections that have been made from it and now, working toward the boiler, the next connection is that to the 90 sq. ft. radiator in the living room. This connection should be 1-inch, area .78 sq. in., and, adding this amount to the area of the three ¾-inch connections, gives a total of 2.10 sq. in., showing that a 2-inch main is ample to serve all of these radiators. The next radiator supplied (working toward the boiler) is the 96 sq. ft. radiator in the sun room. Under ordinary circumstances this radiator should be supplied through a 1-inch valve, but owing to the distance from the main, and consequent length of the branch, it is well to make both the branch and radiator connection 1¼-inch, area 1.22. This branch, as well as the branch to the living room radiator (marked B on Fig. 6), should be taken from the top of the main with a 45-degree or 90-degree connection. Adding 1.22 to 2.10 (the valve area already supplied) gives a total area required of 3.32 sq. in. which, of course, requires a 2½-inch main from the boiler.

Figure 5 shows the main ending at the supply to the kitchen radiator on first floor, and the pipe sizes for this main and the various connections should be figured out on the same basis as we have explained above. Such method will show

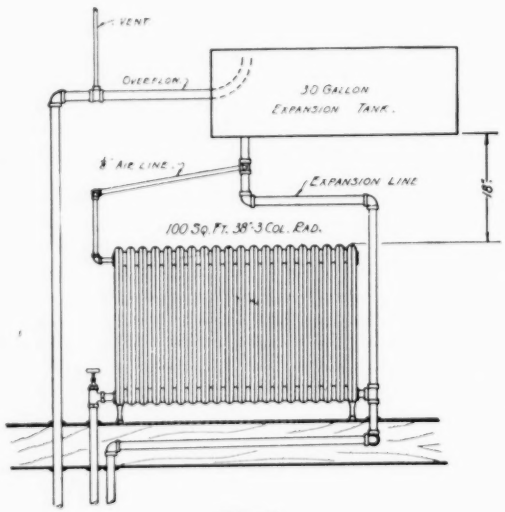


Fig. 7.

that a 2½-inch main from boiler is more than ample to serve the radiation at the rear of the building. A careful study of the method of piping, shown by Figs. 5 and 6, will show the changes that should be made in order to balance the circulation on this job.

Quick and Easy Circulation.

We do not like the long branches, or run outs, from riser to radiator as used between joists for the supplying of second floor radiators. Unless an extremely good pitch is given to these pipes a trapped connection will be the result of constructing the work in this manner. Correspondent indicates that the mains in the basement have practically no pitch whatever. They should pitch upward from the boiler

(Continued on Page 557)

THE RIGHT LETTERS *to* WRITE

EDITOR'S NOTE:—By using one of these Editorials each week in your newspaper advertising you will help to educate your community in the true facts of plumbing and heating merchandising. Such education will create good will and build your business. The more the public knows the better your service will be appreciated. Take one Editorial a week and reprint it in the upper left corner of your regular advertising space. Have it set in bold-faced type, with rule or border around it, as indicated on this page. This will cause the Editorial to stand out and make it easy to read. The use of these Editorials from week to week will not add a dollar to your advertising expense, but they will help along sales.

THIS may be as good a time as any to say something about letters. During the progress of these little preachments, tuned to accompany the Advertising Editorials, not much has been said about letter writing. The ins and outs of advertising and selling have been talked back and forth.

Now we come to our letters. And, believe it or not, letters are the most important of all the tools of business. Every year more sales are made and lost through letters than through any other one channel. The right letters make sales; the wrong letters lose them. The right letters create good will, build friendships. And it is out of our friendships that we make our money. Never forget that.

With this much said, the first question is: what is the right letter?

Before answering that, please accept this bit of advice. When you take your pen in hand to write a letter, or look across your desk to dictate one, don't let writeitis numb your brain. Be yourself. Think as you would think and talk as you would talk if the person to whom you are writing the letter were sitting where your stenographer sits. Be natural. For naturalness, honesty and sincerity are the keynotes of successful letter writing.

The First Step in Letter Writing.

The right letter has more to say about "you" and "yours" than about "me" and "we" or "our." If my letter is all about "me," it is not half so interesting to you as if it is all about "you." Isn't that so? When you get a letter you want to know what is in it for you, don't you? Well, when a person to whom you have written, gets your letter, he wants to know what is in it for him. Keep the other fellow in mind and you have taken the first step in writing the right letter.

The second step is to avoid the old threadbare phrases. Forget such expressions as, "Yours of the 15th inst. at hand and contents noted, and in reply beg to state." You have his letter or you would not be writing him; you know the contents or you could not reply; and why should you beg to state anything?

The third step in successful letter writing is the letter's beginning. Instead of a threadbare phrase, why not begin thus: "Thank you for your good (or interesting) letter of the 15th." There is nothing cold, or stiff, or formal about that. The subject of each letter, or the kind of a person to whom you are writing—one or the other or both should suggest the proper introduction, and should also suggest the general tone of what you write.

The fourth step is the closing of a letter. George M. Cohan used to sing a song, "Always Leave Them Smiling When You Say Goodbye." This could be changed to read, "Always Leave Them Good-Natured in Closing a Letter." You can say many things—even ruffle a man's feelings, if need be—if you are careful to begin the letter in a friendly way, and then are extra careful to close with a warm hand-clasp of friendship.

Plumbing and heating dealers are servants of the people. Their success depends upon their service to their communities. If a person enters your showroom—meets you face to face—he is treated with courtesy and consideration. If he writes a letter, instead of calling, your reply should show the same promptness, consideration and courtesy. Because he is at a distance is no excuse for delay or lack of courteous attention.

The Law of Compensation.

Even though a person writes about something of little or no interest to you, your reply should be just as prompt and just as attentive as if it meant a big contract. It is all in a day's business. Besides, you never can tell. A prompt and courteous answer may be the means of landing a contract some day. Bread cast upon the waters does sometimes return. It is the law of compensation that we get back much of what we give out.

Think carefully of what you write before you write it. Then put a little heart and soul into the writing. Let the reader see you and hear you as though he were in your presence listening.

Letter writing is an art, the basis of which is common sense. And any man can write the right letter if he will take the time to think about what he is writing.

This is a big subject and other points will be mentioned later. For, to repeat, letters can do more good or more harm than anything else associated with your business.

A Series—No. 43.

EMPTY PILES OF STONE.

IN this year of 1922, in these United States, the plumbing and heating bill for new buildings will amount to about four hundred million dollars. So estimate the expert estimators.

Think of that. And these four hundred millions or so do not include new work in old buildings, nor the thousands of repair jobs.

It is easy to see that plumbing and heating stand among the great industries of the world.

Now think of this: Were it not for modern plumbing and heating many buildings could not be built at all.

Take away plumbing and heating and tall buildings would be little more than empty piles of stone; cities would become breeding places for disease and death; the country would hold a miserable people living a miserable life.

Millions upon millions—dollars upon dollars—for what? Not for iron and brass, nor for pipes and fixtures—no, not for these symbols of plumbing and heating. But for convenience and comfort, for health and happiness—for the things that move the world forward and its people upward.

PUMPS

The Development of Apparatus of Indispensable Use to the Plumbing and Heating Contractor

By Ed. Cunningham

(Continued from Page 355 in the August 19th Issue.)

FOR irrigating purposes, the centrifugal single stage pump is much used. In this work the problem is simplified to the last degree, as it is merely a question of delivering a large volume of water against a low head. A table of the capacities of centrifugal pumps given in gallons per minute, cu. ft. per second, and cu. ft. per minute is given in Table 8. This also gives the number of acres which will be covered at various depths from 1 inch to 12 inches, by each size of pump.

For boiler feeding purposes, a table of the capacities of multi-stage centrifugal pumps is given in Table 9. This gives horse powers of boilers from 700 H. P. to 2,450 H. P., and is for feed water temperatures of 212 degrees F.

The effect of a change in specific gravity of liquids, as compared to water is very pronounced. In centrifugal pump work, it affects the head to which the liquid will be sent, and in any kind of a pump will increase or decrease the power required to move a given volume of liquid, as the liquid becomes heavier or lighter than an equal volume of water. In computations affecting the size, speed, and power required, it first becomes necessary to translate the pounds pressure in head in feet of water, and again change the relative head in feet of the water to the corresponding head in feet of the liquid to be pumped. As an example: A pump is to be selected which must elevate a liquid having a specific gravity of 1.3, against a pressure of 50 pounds per square inch. The

Table VIII.

Irrigation Table.

No. of Centrifugal Pump and Diameter Discharge in Inches	Gallons Per Minute	Cubic Feet Per Second	Cubic Feet Per Minute	NUMBER ACRES COVERED IN TWELVE HOURS PUMPING							
				1 In. Deep	2 In. Deep	3 In. Deep	4 In. Deep	6 In. Deep	8 In. Deep	10 In. Deep	12 In. Deep
1	20	.045	2.70	.5327	.2677	.1785	.1338	.0892	.0703	.0535	.0443
1½	50	.11	6.60	1.308	.6504	.436	.3272	.2181	.1636	.1308	.1090
2	100	.22	13.20	2.615	1.171	.7258	.5443	.3629	.2721	.2178	.1814
2½	150	.33	19.80	3.927	1.963	1.309	.9818	.7004	.4909	.3924	.327
3	225	.50	30.00	5.950	2.963	1.983	1.287	.994	.743	.595	.495
3½	300	.66	39.60	7.852	3.927	2.618	1.963	1.308	.981	.785	.654
4	400	.90	54.00	10.710	5.35	3.57	2.608	1.785	1.338	1.071	.892
5	700	1.60	96.00	19.041	9.520	6.343	4.760	3.178	2.376	1.904	1.586
6	900	2.00	120.00	23.801	11.900	7.932	5.950	3.967	2.975	2.380	1.983
7	1,200	2.70	162.00	32.129	16.066	10.710	8.033	5.355	4.016	3.213	2.677
8	1,600	3.50	210.00	41.652	20.826	13.884	10.413	6.942	5.206	4.165	3.471
10	3,000	6.70	402.00	79.735	39.895	25.578	19.933	13.289	9.967	7.973	6.644
12	4,500	10.00	600.00	119.008	59.504	39.761	29.752	19.384	14.876	11.908	9.917
14	6,000	13.30	800.00	158.677	79.476	52.883	39.669	26.446	19.146	15.867	13.223
15	7,000	15.50	930.00	184.463	92.231	61.486	46.046	30.744	23.056	18.446	15.371
16	8,500	18.90	1134.00	224.926	112.46	75.18	56.19	37.67	28.11	22.492	18.74
18	10,000	22.20	1332.00	264.110	132.23	88.157	66.642	44.03	33.026	26.419	22.016
20	14,000	31.10	1866.00	370.110	185.056	123.37	92.521	61.686	46.26	37.010	30.84

Table IX.

Size of Multi-Stage Centrifugal Pumps Recommended for Feeding Boilers.

Horse Power of Boilers Rated Capacity	Feed Water 212° Fahr. Gallons per Minute	Size of Pumps	Revolutions per Minute	Horse Power of Boilers Rated Capacity	Feed Water 212° Fahr. Gallons per Minute	Size of Pumps	Revolutions per Minute
700	50.20	2-5	3500	2800	200.5	4	2500
850	60.92	2-5	3500	3150	225.9	4	2500
1000	71.60	2-5	3500	3500	250.8	4	2500
1200	86.00	2-5	3500	3850	275.8	4	2500
1500	107.50	2-5	3500	4200	301.0	5	2500
1730	125.30	2-5	3500	4900	351.0	5	2200
2000	143.33	3	3100	5600	402.0	5	2200
2100	150.50	3	3100	6300	452.0	5	2200
2450	175.50	3	3100	7000	502.0	5	2200

Table X.

Specific Gravities in Degrees Baume for Liquids Lighter Than Water.

Degrees Baume	Specific Gravity	Degrees Baume	Specific Gravity	Degrees Baume	Specific Gravity	Degrees Baume	Specific Gravity	Degrees Baume	Specific Gravity	Degrees Baume	Specific Gravity
10	1.000	18	0.946	26	0.897	34	0.854	42	0.814	58	0.745
11	0.993	19	0.940	27	0.892	35	0.849	43	0.805	60	0.737
12	0.986	20	0.933	28	0.886	36	0.843	46	0.796	65	0.718
13	0.979	21	0.927	29	0.881	37	0.838	48	0.787	70	0.700
14	0.972	22	0.921	30	0.875	38	0.833	50	0.778	75	0.683
15	0.966	23	0.915	31	0.870	39	0.828	52	0.769		
16	0.959	24	0.909	32	0.864	40	0.825	54	0.761		
17	0.952	25	0.903	33	0.859	41	0.819	56	0.753		

Table XI.

Specific Gravities in Degrees Baume and Twaddle for Liquids Heavier Than Water.

Hydrometer Reading Degrees		Specific Gravity	Hydrometer Reading Degrees		Specific Gravity	Hydrometer Reading Degrees		Specific Gravity	Hydrometer Reading Degrees		Specific Gravity
Twaddle	Baume		Twaddle	Baume		Twaddle	Baume		Twaddle	Baume	
0	.0	1.000	43	25.5	1.215	86	43.4	1.430	129	56.6	1.645
1	.7	1.005	44	26.0	1.220	87	43.8	1.435	130	56.9	1.650
2	1.4	1.010	45	26.4	1.225	88	44.1	1.440	131	57.1	1.655
3	2.1	1.015	46	26.9	1.230	89	44.4	1.445	132	57.4	1.660
4	2.7	1.020	47	27.4	1.235	90	44.8	1.450	133	57.7	1.665
5	3.4	1.025	48	27.9	1.240	91	45.1	1.455	134	57.9	1.670
6	4.1	1.030	49	28.4	1.245	92	45.4	1.460	135	58.2	1.675
7	4.7	1.035	50	28.8	1.250	93	45.8	1.465	136	58.4	1.680
8	5.4	1.040	51	29.3	1.255	94	46.1	1.470	137	58.7	1.685
9	6.0	1.045	52	29.7	1.260	95	46.4	1.475	138	58.9	1.690
10	6.7	1.050	53	30.2	1.265	96	46.7	1.480	139	59.2	1.695
11	7.4	1.055	54	30.6	1.270	97	47.1	1.485	140	59.5	1.700
12	8.0	1.060	55	31.1	1.275	98	47.4	1.490	141	59.7	1.705
13	8.7	1.065	56	31.5	1.280	99	47.8	1.495	142	60.0	1.710
14	9.4	1.070	57	32.0	1.285	100	48.1	1.500	143	60.2	1.715
15	10.0	1.075	58	32.4	1.290	101	48.4	1.505	144	60.4	1.720
16	10.6	1.080	59	32.8	1.295	102	48.7	1.510	145	60.6	1.725
17	11.2	1.085	60	33.3	1.300	103	49.0	1.515	146	60.9	1.730
18	11.9	1.090	61	33.7	1.305	104	49.4	1.520	147	61.1	1.735
19	12.4	1.095	62	34.2	1.310	105	49.7	1.525	148	61.4	1.740
20	13.0	1.100	63	34.6	1.315	106	50.0	1.530	149	61.6	1.745
21	13.6	1.105	64	35.0	1.320	107	50.3	1.535	150	61.8	1.750
22	14.2	1.110	65	35.4	1.325	108	50.6	1.540	151	62.1	1.755
23	14.9	1.115	66	35.8	1.330	109	50.9	1.545	152	62.3	1.760
24	15.4	1.120	67	36.2	1.335	110	51.2	1.550	153	62.5	1.765
25	16.0	1.125	68	36.6	1.340	111	51.5	1.555	154	62.8	1.770
26	16.5	1.130	69	37.0	1.345	112	51.8	1.560	155	63.0	1.775
27	17.1	1.135	70	37.4	1.350	113	52.1	1.565	156	63.2	1.780
28	17.7	1.140	71	37.8	1.355	114	52.4	1.570	157	63.5	1.785
29	18.3	1.145	72	38.2	1.360	115	52.7	1.575	158	63.7	1.790
30	18.8	1.150	73	38.6	1.365	116	53.0	1.580	159	64.0	1.795
31	19.3	1.155	74	39.0	1.370	117	53.3	1.585	160	64.2	1.800
32	19.8	1.160	75	39.4	1.375	118	53.6	1.590	161	64.4	1.805
33	20.3	1.165	76	39.8	1.380	119	53.9	1.595	162	64.6	1.810
34	20.9	1.170	77	40.1	1.385	120	54.1	1.600	163	64.8	1.815
35	21.4	1.175	78	40.5	1.390	121	54.4	1.605	164	65.0	1.820
36	22.0	1.180	79	40.8	1.395	122	54.7	1.610	165	65.2	1.825
37	22.5	1.185	80	41.2	1.400	123	55.0	1.615	166	65.5	1.830
38	23.0	1.190	81	41.6	1.405	124	55.2	1.620	167	65.7	1.835
39	23.5	1.195	82	42.0	1.410	125	55.5	1.625	168	65.9	1.840
40	24.0	1.200	83	42.3	1.415	126	55.8	1.630	169	66.1	1.845
41	24.5	1.205	84	42.7	1.420	127	56.0	1.635	170	66.3	1.850
42	25.0	1.210	85	43.1	1.425	128	56.3	1.640	171	66.5	1.855

Table XIII.

Pressure of Water at Different Heads.

Feet Head of Water and Equivalent Pressure. Pressure and Equivalent Feet Head of Water.

Feet Head	Pounds per Square Inch	Feet Head	Pounds per Square Inch	Feet Head	Pounds per Square Inch	Pounds per Square Inch	Feet Head	Pounds per Square Inch	Feet Head	Pounds per Square Inch	Feet Head
1	.43	60	25.99	200	86.62	1	2.31	40	92.36	170	392.52
2	.87	70	30.32	225	97.45	2	4.62	50	115.45	180	415.61
3	1.30	80	34.65	250	108.27	3	6.93	60	138.54	190	438.90
4	1.73	90	38.98	275	119.10	4	9.24	70	161.63	200	461.78
5	2.17	100	43.31	300	129.93	5	11.54	80	184.72	225	519.51
6	2.60	110	47.67	325	140.75	6	13.85	90	207.81	250	577.24
7	3.03	120	51.97	350	151.58	7	16.16	100	230.90	275	643.03
8	3.40	130	56.30	400	173.24	8	18.47	110	253.98	300	692.69
9	3.90	140	60.63	500	216.55	9	20.78	120	277.07	325	750.41
10	4.33	150	64.96	600	259.85	10	23.09	125	288.62	350	808.13
20	8.66	160	69.29	700	303.16	20	34.63	130	300.16	375	865.89
30	12.99	170	73.63	800	346.47	30	46.18	140	323.25	400	922.58
40	17.32	180	77.96	900	389.78	40	57.72	150	346.34	500	1154.48
50	21.65	190	82.29	1000	433.09	50	69.27	160	369.43	1000	2308.00

Table XIV.

Gallons of Water Flowing per Minute for Each Inch of Length of Weir Opening, at the Given Depths at the Lip.

Inches Depth	Gallons per Minute	Inches Depth	Gallons per Minute	Inches Depth	Gallons per Minute	Inches Depth	Gallons per Minute	Inches Depth	Gallons per Minute	Inches Depth	Gallons per Minute
1	3.06	2 5/8	12.96	4 1/8	25.47	5 3/8	40.50	7 1/8	57.78	8 5/8	76.95
1 1/8	3.60	2 3/4	13.86	4 1/4	26.64	5 1/2	41.85	7 1/4	59.31	8 3/4	78.66
1 1/4	4.22	2 7/8	14.85	4 3/8	27.81	5 5/8	43.29	7 3/8	60.84	8 7/8	80.28
1 3/8	4.86	3	15.75	4 1/2	28.98	6	44.64	7 1/2	62.37	9	81.99
1 1/2	5.58	3 1/8	16.74	4 5/8	30.24	6 1/8	46.08	7 5/8	63.99	9 1/8	83.70
1 3/4	6.30	3	17.82	4 3/4	31.41	6 1/4	47.43	7 3/4	65.52	9 1/4	85.41
1 7/8	7.02	3 1/4	18.81	4 7/8	32.67	6 3/8	48.87	7 7/8	67.14	9 3/8	87.21
1	7.83	3 3/8	19.89	5	33.93	6 1/2	50.31	8	68.76	9 1/2	88.92
2	8.64	3 5/8	20.97	5 1/8	35.28	6 5/8	51.75	8 1/8	70.30	9 5/8	90.27
2 1/8	9.45	3 3/4	22.05	5 1/4	36.54	6 3/4	53.28	8 1/4	72.00	9 3/4	92.43
2 1/4	10.26	3 7/8	23.13	5 3/8	37.89	6 7/8	54.72	8 3/8	73.62	9 7/8	94.23
2 1/2	11.97	4	24.30	5	39.15	7	56.25	8 1/2	75.24	10	96.04

Corrections for Velocity of Approach.

Velocity of Approach, in feet per second	.5	1	1.5	2
Addition to measured depth, in inches	1/8	1/4	3/8	1 3/8

first step is to translate the pounds pressure into equivalent head of water. Each pound pressure represents an elevation of 2.3 pounds per square inch; therefore 50x2.3 = 115 ft. in height. Water has a specific gravity of 1.0; to change the head in feet, 115 ÷ 1.3 (the specific gravity of the liquid to be pumped) = 88.46 ft., as the head to which the heavier liquid will be delivered, and for which the speed and impeller design is to be adopted. A pump is selected for the service from the recommendations of the manufacturer. Suppose that the pump selected required 15 H. P. to elevate

Table XII.

Inches of Mercury with Equivalent Head of Water.

Inches of Mercury	Feet Head of Water	Inches of Mercury	Feet Head of Water	Inches of Mercury	Feet Head of Water
1	1.13	11	12.43	21	23.73
2	2.26	12	13.56	22	24.86
3	3.39	13	14.69	23	25.99
4	4.52	14	15.82	24	27.12
5	5.65	15	16.95	25	28.25
6	6.78	16	18.08	26	29.38
7	7.91	17	19.21	27	30.51
8	9.04	18	20.34	28	31.64
9	10.17	19	21.47	29	32.77
10	11.30	20	22.60	30	33.90

enough to permit the water to be quiet before it reaches the weir and wide enough so that the flow will not be too rapid. Four feet back of the weir a post is set with its top exactly level with the lip. A rule set on this post serves to measure the depth of the water flowing over the lip.

The gallons per minute which will flow over such a weir for each inch of length of the opening is shown in Table 14. It is sometimes necessary to correct for rapid flow or "velocity" of approach. This is done by dropping small and light sticks on the surface of the water, and timing the velocity of the stick. At the bottom of Table 14 are given

Table XVI.

Table of Effective Fire Streams.

Jno. R. Freeman, C. E.

Using 100 ft. of 2½-inch ordinary best quality rubber lined hose between nozzle or hydrant, and pump.

SMOOTH NOZZLE, SIZE	¾ INCH						⅞ INCH						1 INCH					
Pressure at Hydrant, Pounds	32	43	54	65	75	86	34	46	57	69	80	91	37	50	62	75	87	100
Pressure at Nozzle, Pounds	30	40	50	60	70	80	30	40	50	60	70	80	30	40	50	60	70	80
Vertical Height, Feet of Effective Stream	48	60	67	72	76	79	49	62	71	77	81	85	51	64	73	79	85	89
Horizontal Distance, Feet, Effective Stream	37	44	50	54	58	62	42	49	55	61	66	70	47	55	61	67	72	76
Gallons Discharge, per Minute	90	104	116	127	137	147	123	142	159	174	188	201	161	186	208	228	246	263
SMOOTH NOZZLE, SIZE	1⅛ INCH						1¼ INCH						1⅜ INCH					
Pressure at Hydrant, Pounds	42	56	70	84	98	112	49	65	81	97	113	129	58	77	96	116	130	154
Pressure at Nozzle, Pounds	30	40	50	60	70	80	30	40	50	60	70	80	30	40	50	60	70	80
Vertical Height, Feet of Effective Stream	52	65	75	83	88	92	53	67	77	85	91	95	55	69	79	87	92	97
Horizontal Distance, Feet, Effective Stream	50	59	66	72	77	81	54	63	70	76	81	85	56	66	73	79	84	88
Gallons Discharge, per Minute	206	238	266	291	314	336	256	296	331	363	392	419	315	363	406	445	480	514

the required amount of water the 88.46 ft. desired. As the power bears a direct proportion to the specific gravity (if the viscosity is the same), the power required will be 15 H. P. x 1.3 = 19.5 H. P. for the heavier liquid. In handling liquids which are lighter than water, the same proceeding holds good, only of course the heads will be higher, and the power less, in proportion.

Water is taken as the standard of specific gravity for solids and liquids, with a specific gravity of 1.00. Measurements of the relative specific gravity of other liquids are expressed in Degrees Baume, (pronounced Bo-May′) or in Degrees Twaddle. Table 10 and Table 11 give the corresponding specific gravity of liquids lighter than water on the Baume scale; and for liquids heavier than water, on both Baume and Twaddle Hydrometers.

There is given in Table 12 the pressure per square inch at the bottom of a tube for inches of head of mercury, from one inch high up to 30 inches in height, the latter being the standard height, to which the atmosphere will raise a column of mercury in an enclosed tube at sea level. (The exact height is 29.92 inches.) There is also given the corresponding height in feet of a column of water. It will be noted for instance that a column of water 33.9 ft. high will balance a column of mercury 30 in. high. A column of water 33.9 ft. high could be sustained in a tube which was completely emptied of air; that is one in which a gauge indicated 30 in. of mercury. As this cannot be attained in practice, the actual limit, as remarked before, is about 22 ft.

For convenience, Table 13 is included; this gives the head in feet of water and the various pressures per square inch, resultant therefrom, from 1 ft. head up to 1,000 ft. head; and a reverse of that, showing pressures from 1 pound up to 1,000 pounds per square inch, with the corresponding head in feet of water.

In measuring the flow of water for water supply, for irrigation, etc., the usual method is to gauge the flow of water by constructing a weir. This consists of a rectangular notch cut in a board or dam across the stream or in the side of a box from which the water is issuing; the notch should be centered, and if in a box should not be more than 75 per cent of the width of the box. The water should not be of greater depth than 10 in., nor less than 1 in., and the drop outside must be twice as great as the depth over the weir. The edges should be beveled. The box should be long

Table XV.

Discharge of Water in Cubic Ft. per Minute for a Stream Having an Area of 1 Sq. Inch. From 1-Ft. Head to 120-Ft. Head.

Head	Discharge	Head	Discharge	Head	Discharge
1	3.34	51	23.85	101	33.57
2	4.73	52	24.08	102	33.73
3	5.79	53	24.31	103	33.90
4	6.68	54	24.54	104	34.06
5	7.47	55	24.76	105	34.22
6	8.18	56	24.94	106	34.39
7	8.84	57	25.21	107	34.59
8	9.45	58	25.43	108	34.71
9	10.02	59	25.65	109	34.87
10	10.51	60	25.87	110	35.03
11	11.08	61	26.08	111	35.19
12	11.57	62	26.29	112	35.35
13	12.50	63	26.49	113	35.50
14	12.94	64	26.72	114	35.66
15	13.38	65	26.92	115	35.82
16	13.78	66	27.13	116	35.97
17	14.18	67	27.33	117	36.12
18	14.57	68	27.54	118	36.28
19	14.95	69	27.74	119	36.43
20	15.31	70	27.94	120	36.58
21	15.67	71	28.14	121	36.73
22	16.02	72	28.34	122	36.88
23	16.37	73	28.53	123	37.03
24	16.71	74	28.73	124	37.18
25	17.04	75	28.93	125	37.33
26	17.36	76	29.11	126	37.48
27	17.55	77	29.30	127	37.63
28	17.68	78	29.49	128	37.78
29	17.99	79	29.68	129	37.93
30	18.30	80	29.87	130	38.07
31	18.60	81	30.06	131	38.22
32	18.90	82	30.24	132	38.37
33	19.20	83	30.42	133	38.51
34	19.47	84	30.61	134	38.66
35	19.77	85	30.79	135	38.80
36	20.05	86	30.97	136	38.95
37	20.33	87	31.15	137	39.09
38	20.60	88	31.33	138	39.23
39	20.87	89	31.50	139	39.37
40	21.13	90	31.68	140	39.51
41	21.38	91	31.86	141	39.65
42	21.64	92	32.04	142	39.79
43	21.90	93	32.20	143	39.93
44	22.15	94	32.38	144	40.07
45	22.40	95	32.55	145	40.21
46	22.65	96	32.72	146	40.35
47	22.89	97	32.89	147	40.49
48	23.14	98	33.06	148	40.63
49	23.38	99	33.23	149	40.77
50	23.61	100	33.40	150	40.90

the corrections to be made by adding to the measured depth for various velocities from ½ ft. to 2 ft. per second.

The amount of water which will issue from an orifice having an area of 1 sq. in. is given in Table 15, in cubic feet per minute for heads of 1 ft. up to 120 ft. This may be changed to gallons per minute by multiplying by 7.48 (approximately 7½).

In estimating the amount of water to be furnished for fire

protection purposes, the size of pump and horse power required is based on the number and size of the nozzles, and the pressures at the hydrant. Two hundred and fifty gallons per minute with 80 pounds pressure at the hydrant will give a good standard fire stream. A "Table of Effective Fire Streams," Table 16, is included. This table has been calculated by John R. Freeman, C. E.

(To be Continued.)

W. J. WOOLLEY DELIVERS STIRRING ADDRESS IN CEDAR RAPIDS.

William J. Woolley unloosed a little of his well known thunder on the master plumbers of Cedar Rapids, Iowa, recently, and so enthusiastic was the audience that some of them were on the point of suggesting Woolley for president of the United States. In a manner characteristic of him, Mr. Woolley left the platitudes and compliments for someone else, plunging into the heart of the matter and telling them what is the matter with the plumbing business. Advocating better business methods, he told them that accounting and cost systems are absolute essentials in modern day business.

C. L. Kidd of the Cedar Rapids Pump Co., presided at the meeting and beside introducing Mr. Woolley he also introduced C. A. Wright, a plumbing contractor from Waterloo who addressed the assemblage briefly.

The musical programme was rendered by Rudolph Pohl, a local master plumber, his brother-in-law, P. F. Paschell and the three Dieman sisters, daughters of Ed. Dieman, an old time master plumber of Cedar Rapids.

Following the meeting those who were in attendance were taken on a tour of inspection of the plant of the Chandler Pump Company.

BLACKBOARD EPIGRAMS

IF you belong to the blackboard fraternity it is a good plan to be on the lookout for choice epigrams, and pick them wherever you find them. The weekly seven presented in this space will serve. But if you find any that you like better, use them. A variety of people pass your place of business, so it is well to write a variety of epigrams on your blackboard.

The man who wakes up and finds himself famous hasn't been asleep.

* * *

There is as much thrift in saving time as in saving money.

* * *

The onion is a lily gone mad.

* * *

Most of the troubles we worry about never happen.

* * *

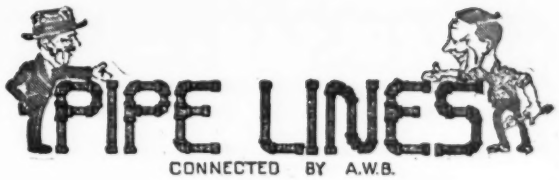
If you stand on your own feet nobody can tell you where to get off.

* * *

Getting ahead is the art of making the best of what you have.

* * *

There are two kinds of people. The up-and-comings and the down-and-goings.



MY NEW SUIT OF CLOTHES.

(Here's the third verse in this prolonged jingle. What was said when you got your new suit?)

When I got my new suit of clothes,
Lady friends pinned on me a rose.
Some said the suit was loose and bad,
Some said it made my face look sad,
Some said it was too awfully tight,
Some said, "My, my! ain't it a sight?"
The things not said nobody knows—
When I got my new suit of clothes.

W. W., Minneapolis.

SHE WAS SO IGNORANT.

Mrs. Newlywed to old family physician: "Now, Doctor, I want you to tell me the worst about John."

Doctor: "He is suffering from paralysis of the muscles, superinduced by an over-indulgence of alcoholic stimulants."

Mrs. N-W: "Is that all? And to think of it, that beastly taxi driver who brought him home said he was drunk."

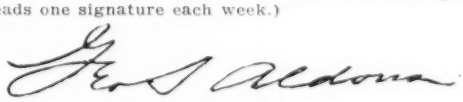
T. M., Lock Haven, Pa.

The man who was out rowing in a leaky boat and bored a hole in the bottom to let the water out was not a plumber.

S. T. R., Kansas City, Mo.

AS READ BY BOMBO.

(Send a bit of news, or an experience, or an idea you have used, or something; sign your name to it, and see if Bombo, the handwriting expert, can read your outstanding traits. He reads one signature each week.)



George S. Aldous, plumbing and heating dealer, Passaic, N. J. He likes to be at the top, and he is. He has the ability to see ahead. He knows that a certain thing done today will produce a certain result tomorrow. He keeps his future in front of him, not behind him. BOMBO.

Abe Martin says: "I'd rather have a plumber in th' house any old time than one of these new fangled nurses."

STEADY THERE!

Women's skirts seem to be plumb out of line. Some are up and some are down and some are wavering in between.

T. S., Chicago.

THE CHIEF PROBLEM OVERCOME.

"I've taken the most important step toward building a fashionable apartment house."

"What? Let the contract for the plumbing and heating?"

"Oh, no—I've selected a fancy name for the building."

MIKE QUINN, Scranton, Pa.

I WONDER?

I wonder what a plumber says when a water pipe in his own home freezes? FELIX, New York.

A laundry sign in Tokyo, Japan: "Ladies washed inside and out."

WITHIN THE THREE MILE LIMIT, TOO.

A sign over the liquid soap container in the lavatory of one of the lake boats reads, "Positively Not to Drink."

Sent in by A. E. B., Toledo, Ohio.

FORCE OF HABIT.

"I hear that old landlord of yours is going to open a sanitarium."

"If he does I'll bet he makes a specialty of cold-water baths." K. K., Keokuk, Iowa.

We are celebrating the first anniversary of Pipe Lines. Thanks to all contributors and readers for making the Lines what they are today. A. W. B.

QUESTIONS & ANSWERS

This department is a clearing house for ideas and is open to every reader of "Domestic Engineering." Problems sent in are replied to at the earliest possible moment by "Domestic Engineering," and this department can be made more valuable if readers themselves will help the man who needs assistance. Read the questions and answers. If you have had similar problems, or know from experience how the faults can be remedied, do not hesitate to send in your comment or criticism. It will be some satisfaction to you to know that you have helped a fellow craftsman and a pleasure for us to pass on the data. "Every man owes some of his time to the upbuilding of the profession to which he belongs."

AREA OF RADIATOR VALVES AND CIRCLE AREA OF PIPE.

Editor, "Domestic Engineering":—I wish you would give me the valve area of radiator valves from ½" to 2".

Also give me the circle area of pipe from 1¼ to 4".

Virginia. C. S. M.

The circle or inside area of wrought iron or steel pipe, in size from 1¼ to 4 inches, is as follows:

Size of Pipe	Inside Area Sq. Inches
1¼	1.50
1½	2.04
2	3.36
2½	4.78
3	7.38
3½	9.89
4	12.73

The area of radiator valves from ½ to 2 inches is:

Size of Valve	Area in Sq. In.
½ inch	.20
¾ "	.44
1 "	.78
1¼ "	1.22
1½ "	1.76
2 "	3.14

In sizing the piping of a hot water heating system it is customary to circle area for sizing the pipes as well as the valves. While the inside area of commercial pipe varies slightly from the area of a circle of the same size, the difference need not be considered.

PURIFYING SEPTIC TANK SEWAGE FROM TUBERCULAR SANITARIUM.

Editor, "Domestic Engineering":—We have a state institution here that has twenty-two toilets, four bath tubs, eight showers, twelve lavatories, three urinals, five slop sinks and three kitchen sinks, using about 7,000 gallons of water per day. These are all connected to a septic tank, 11 by 15 ft., and 3 ft deep, with three partitions. The water waste coming from this tank is about the same as when it enters. Would like to know what size tank it would take to purify the waste and eliminate the odor? This institution is a tubercular sanitarium. G. R. W.

Oklahoma.

The cubical contents, or capacity of the septic tank is 11×15×3=495 cubic ft. There are 7.48 gallons in one cubic ft., say 7.5 gallons. Therefore the tank capacity is 495×7.5=3712.5 gallons or practically one-half of a day's sewage.

This means that the period of retention is 12 hours, providing that the flow of sewage is nearly steady day and night, and that the flow through the tank is uniform with no sluggish corners or chambers.

As most of the sewage will go through the tank from perhaps 6 a. m. to, say 8 p. m., and as the proportions of the tank appear to be unfavorable for a uniform flow, it

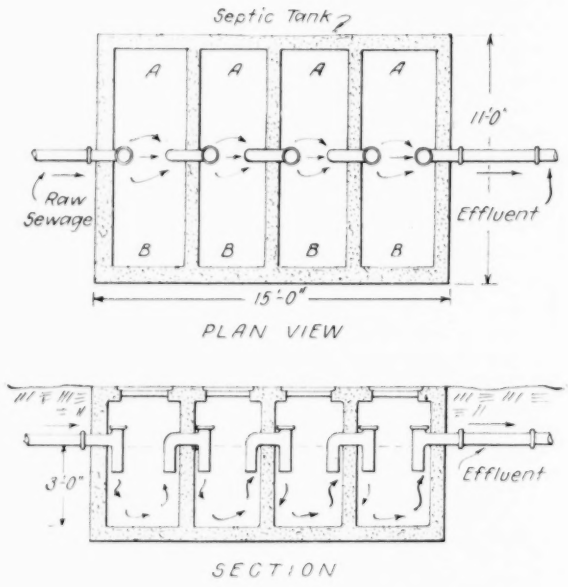


Fig. 1.

seems safe to estimate that some of the sewage will get through the tank in 6 hours or less. But even with a 6-hour retention the effluent should be comparatively clear, if the tank were designed properly. We do not consider 3 ft. deep enough. Twice that depth is much better.

We believe your tank is not properly designed for the work on hand. Of course, this is only "surmise" on our part, as you do not show plans of its construction. If it is a plain "through flow" tank like Fig. 1 it is not a good tank.

Your raw sewage has too direct a flow to the outlet or effluent pipe. The corners A, B, are practically dead ends with little or no flow through them. Besides, the 3 ft. depth is not enough to prevent the flow from agitating the sludge, or solids on the bottom.

If the tank is built like Fig. 2, this defect of direct flow through will be more or less abated. Then the sewage will have to flow over the full area of the tank and so insure a much longer retention.

In a tank like Fig. 2 the retention may safely be reckoned as 6 hours at least, and in first-class, prime septic

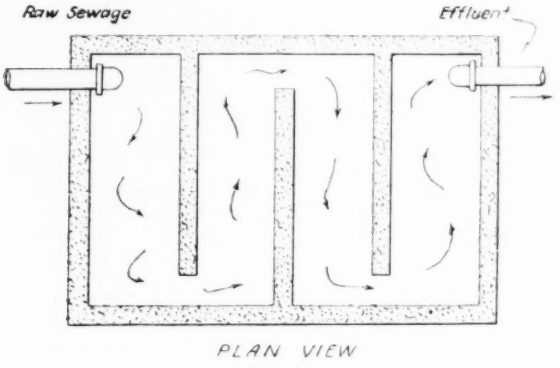


Fig. 2.

action with proper sedimentation this is often considered enough.

But in septic tanks for tubercular institutions, contagious disease hospitals and the like, the solids do not have a chance to putrefy and become digested quickly, because of the disinfectants that usually are quite generally used.

These disinfectants are used by the nurses, doctors and

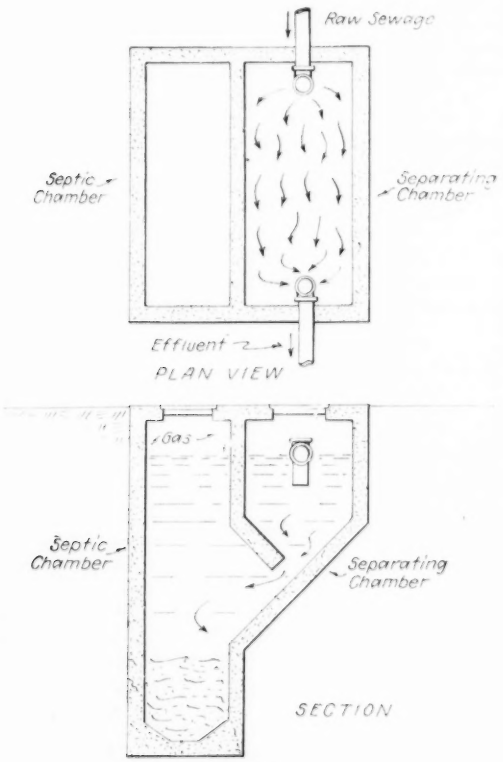


Fig. 3.

attendants to kill germs, in the housecleaning operations, in the excreta and sputum, etc., and it all goes into the septic tank. There it also kills the very bacteria that the septic tank has to depend upon for its successful operation. It prevents the prompt and proper breaking up and digestion of the solids. This, we think troubles you about as much as anything else.

It would appear that a "flow through" septic tank is not adapted to sewage that has been previously subjected to disinfectant-treatment. The type of tank we prefer for such cases is of the well known "Imhoff" principle. Fig. 3 shows one that we are sure would be much more satisfactory than the tank you appear to have.

This tank has two chambers, which perform entirely different functions. The separating chamber, through which the raw sewage flows, as per the arrows, is only for the purpose of separating the solid matter from the liquid by sedimentation. Then the comparatively clear liquid flows out through the effluent pipe. The solid matter settling in this chamber slides down the sloping bottom and into the septic chamber through the slit opening under the partition. There is no flow through the septic chamber. The water there is dead and stagnant. The solids decompose there, and the turbulence of their gassing up does not mix with the raw sewage. The stench and filth is retained in the septic chamber separate from the fresh sewage water flowing through the separating chamber. Thus a cleaner and fresher effluent is generally assured.

But it is not safe. It may contain many pathogenic, or disease-producing bacteria which must be destroyed before the liquid is allowed to go to a creek, river or other place of disposal.

The destruction may be accomplished in different ways, but the one that appeals to us as most practical is complete sterilization by the injection of chlorine gas. There are machines on the market for this purpose. Many sewage plants are already equipped with them. We know a sanitary engineer who installed one to sterilize the effluent from a contagious disease hospital and it worked well. He recommends it for use on effluent lines from all contagious diseases buildings, and a tubercular institution is no exception.

FIGURING RADIATION FOR BELOW ZERO TEMPERATURES.

Editor, "Domestic Engineering":—I take it that the "Table of Estimated Radiation," by Harry B. Perrigo, is figured from zero degrees outside and 70 degs. inside. We have to figure 10 or 15 degs. below zero here. Please inform me how to use the table to meet conditions here.

Pennsylvania. E. F. B.

In listing tables of figured radiation it is customary to base the figures upon a temperature difference of 70 degs., that is to say, upon an inside temperature of 70 degs. when the temperature outside is at zero. There are some exceptions to this rule, but they are so few that we need not consider them. With all tables it is usual to give multiplying factors or percentages that may be used for temperatures other than those upon which the table is based.

A common method, and one sufficiently correct for your purpose, is to add 10 per cent to the figures given in the table for a temperature of 5 degs. below zero, 20 per cent for 10 degs. below zero, and 30 per cent for an outside temperature 15 degs. below zero. Of course, you will understand that in using the table you will make such allowances as are required for rooms located on the windward or exposed side of a building; also, for poor building construction or intermittent heating.

No one rule can be given or assembled that will cover more than standard conditions. A table of figured radiation is all right for quick or approximated results, but the better plan is to figure out the requirements of each building on a B. t. u. basis and use the table as a means to check possible errors in estimating.

A QUESTION IN HYDRAULICS.

Editor, "Domestic Engineering":—Could you advise me what the difference would be where water starts at a spring with 2-inch pipe, say for a mile, emptying into a 4-inch pipe running ½-inch into houses, and pressure at house being 40 lb.? What difference would there be in pressure at house running 6-inch where the 2-inch is and connecting on to the same 4-inch?

Quebec. R. E. A.

This is a question in hydraulics which involves many different factors, and much more data than is given in the question.

The volume delivered in a given time is one of the most important factors required to determine the hydraulic pressure in the building when the water is flowing.

If the delivery volume is small the increase in pressure due to a larger supply line, will not be great. But if the volume delivered is great—say maximum flow of the 2-inch line, then the pressure increase due to a 6-inch line will certainly be very much higher—perhaps almost up to the hydrostatic pressure.

When no water is being drawn at the houses the smaller supply line will furnish the same pressure as the proposed larger line because then there will be no friction loss.

Regarding static pressure the head is the all important factor. There will be a pressure in each house of .434 lb. per sq. inch per foot of vertical height between house and reservoir.

Thus if the reservoir is 100 feet higher than a certain house the hydrostatic pressure will be 43.4 lb. per sq. inch.

But when a faucet is opened the pressure drops. The smaller the pipe the greater the drop.

Perhaps the following formula—by William Cox, a noted hydraulic engineer, will be useful to you in computing the friction head which, when found would have to be deducted from the hydrostatic head in order to determine the resultant pressure when the water is flowing. You can apply this to the case in question getting the necessary data from the job.

$$\left(\frac{L}{d}\,\frac{4V^2+5V-2}{1{,}200}\right)0.433.$$

In this formula V=velocity of water in feet per second.
L=length of pipe in feet.
d =diameter of pipe in inches.

RETURN LINE PIPING.

Editor, "Domestic Engineering":—I am sending herewith sketch of a heating job I have to install and want your idea of the best method to use to run the mains and returns. I have shown an offset which will place boiler water line very low and my returns would come very little above the water line with very slight fall. I will watch in the magazine for your dope.

New Jersey. D. R. W.

According to the sketch submitted, shown as Fig. 1, the water line of the boiler to be used on this work is 6 ft. 9 in. above the floor of the low section of the basement, the total height of which is but 7 ft., therefore, there is but 3 in. between the water line and the under side of the beams supporting the floor above.

It is not possible to plan a system of gravity piping for this work that will give satisfactory service without pitting the boiler. Using a main of a size designed to allow of a reasonable pressure loss at the end, there should be a distance of 18 in. between the water line of the boiler and the extreme end of the main or the end of a dry return. By a reasonable pressure loss, or pressure drop, is meant four ounces or less. Let us suppose that there is a pressure drop of four ounces. In this case the water in the return drop or drip from the end of the main will stand practically 7 in. above the water line of the boiler. Now, we require some head to give a small excess of pressure to put the water back into the boiler even though the pressure between main and return has been equalized. A height of 3 in. or 4 in. will give this pressure. If 3 in. was added to the 7 in. height required to equalize the difference in pressures, the water in the drop pipe would stand 10 in. higher than the water line of the boiler.

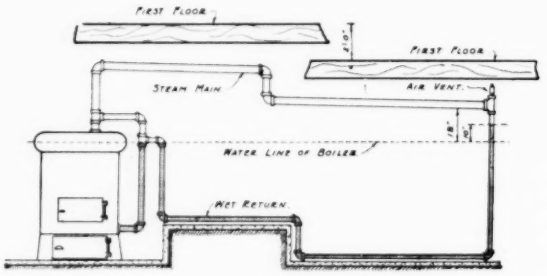


Fig. 2.

If the heating system operated always under unvarying conditions, and the piping had been planned to allow of a four ounce drop in pressure at the end of the main, there would be no reason for increasing the distance between water line and end of main beyond 10 in.; velocities and friction being constant, there would be no trouble with the water line. However, as a matter of fact, outside temperatures vary materially and change suddenly and as a result the amount of steam condensed in order to maintain the desired temperature will be increased in proportion to the change in outside temperature, and the increased pressure changes the conditions of velocity and friction, increasing rather than decreasing these factors, and therefore will produce a greater pressure drop at the end of the main.

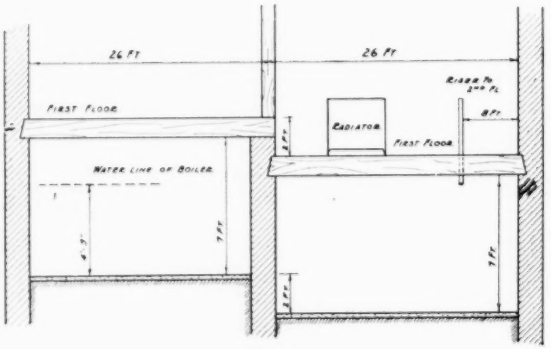


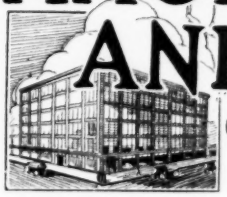
Fig. 3.

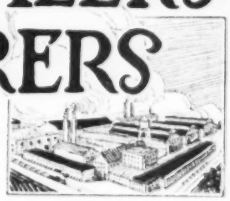
Experience has demonstrated that there should be at least 18 in. difference between the low point of the main and the water line of the boiler, and we advise correspondent to pit the boiler sufficiently to enable the piping to be installed in such a manner that this distance can be maintained. The return can be installed as a wet or dry return as may be desired. Fig. 2 will illustrate the requirements.

CLEVELAND, OHIO, PLUMBERS PLAN CLAMBAKE.

It was announced this week that the Cleveland, O., east side plumbers are planning a clam bake to take place at Metz Grove around the first of October. Frank Smith who is chairman of the entertainment Committee is in charge of the affair.

AMONG THE WHOLESALERS AND MANVFACTVRERS





CRANE-ORDWAY CO., NOW CRANE CO.

The nine branches and warehouses of the Crane-Ordway Co., through which the Crane Co., Chicago has been operating in Minnesota, South Dakota and Montana, will hereafter be known as the Crane Co. of Minnesota, it was announced in a statement issued by the company. The Crane-Ordway Co. was incorporated in 1893, starting in business in St. Paul on January 1st of that year. The recent change was made so that the company will have a uniform corporate name all over the country, and the management and personnel will remain unchanged.

AMERICAN RADIATOR CO. MOVES SOUTHERN BRANCH.

The American Radiator Company, Buffalo, N. Y., has sent the following letter which is self-explanatory to all of its customers in the Southern District: "Effective September 15th our branch headquarters will be moved from Birmingham to Atlanta, and thereafter be known as the Southern Branch. Therefore, we ask that any communications addressed to us be sent to 232 Peachtree Street, Atlanta, Georgia."

T. K. McKNIGHT CALLED BY DEATH.

T. K. McKnight, who was, up until the time of his death, in charge of the Cleveland office of Crane Company, Chicago, died quite suddenly last Saturday in Cleveland. His death, which was caused by heart failure, came as a shock to his friends as he apparently had been in good health. Mr. McKnight was 58 years of age, and for the last twenty years he has been associated with Crane Company.

KLEIN AND SCHOENBERGER DISSOLVE PARTNERSHIP.

The co-partnership consisting of Benjamin F. Klein and William J. Schoenberger, trading as United Brass Manufacturing Company, 3844 Hamilton Avenue, Cleveland, Ohio, has been dissolved.

The United Brass Manufacturing Company continues as heretofore in the manufacture of plumbing and water works brass goods at its present location, under the sole ownership of Mr. Benjamin F. Klein.

Mr. William J. Schoenberger withdraws, and takes over the gas valve and stove cock department, which will be operated by The W. J. Schoenberger Company, Harvard Avenue at 103rd Street, Cleveland, O., manufacturing brass gas valves, gas cocks and fittings.

MOVES FROM NEW YORK CITY TO FREEPORT, LONG ISLAND.

The Sanitary Equipment & Manufacturing Co., Inc., now at 220-222 E. 38th Street, New York City will move to Freeport, L. I., on October 1, it has been announced by the officers of the company.

WESTERN TRADE GOLF ASSOCIATION PLAYS AT OLYMPIA FIELDS.

Proving his superiority over a field of thirty-seven players, H. W. Craig of the Western Trade Golf Association, took possession of the Association's silver trophy at the September 12 meet, held at Olympia Fields. Mr. Craig's card which was the best for the day read Gross 84 Net 70.

A touch of fall in the air, prophetic of the day when the old sticks will be laid away for a few months, served to temper the heat of the sun just enough to make this the best playing day that the Association has had this year, and thirty-seven members took advantage of that fact, most of them playing nine holes in the morning and eighteen in the afternoon, making up eight foursomes a threesome and a twosome.

At the September Meet of the Western Trade Golf Association. Top Row: C. C. Todd, E. W. Sanborn, C. D. Little, Henry O'Callaghan, T. P. Wade, L. Bruce Fulton. Middle Picture: Joe Carroll, John Fetter and E. V. Crews. Lower Corners, A. S. Lindeblad and B. C. Shutz.

Olympia Fields is known as one of the most beautiful courses in the central west, and it seems to be a title well deserved. There are three eighteen hole courses in use and a fourth, now under construction, will be ready next summer. The Association meet was played off on the first eighteen.

The biggest upset of the day came when the winner of the Duffer's cup was announced, for the winner of the well known pipes and fittings trophy turned out to be no less celebrity than the secretary of the Association, Peter Munn. Secretary Munn tried to make a brief speech of appreciation upon being informed of his signal honor, but words failed him and he sat down in gloomy meditation of his disastrous score of 104 net.

In the morning round the best card for the nine was that of Mr. Brownell, a guest of the Association who played it

in 35 net. C. D. Little's 36 was second best while Harold Cross was third was 37. C. D. Little was also runner up in the afternoon's play, with a fine card of 74 net for the eighteen holes.

The flight winners were: C. D. Little, 74; H. N. Booth, 80; E. C. Garrity, 83; B. A. Schutz, 79; A. S. Lindeblad, 92; W. E. McCollum, 95; J. Fetter, 87; L. B. Fulton, 81; H. Crum, 82.

The next meet, which will be the last of the season, will be held at Calumet, which was also the scene of the first tournament of this year. The season prizes will be awarded at this event, there will be a number of special prizes, and the fact that the last get together of the year is usually the biggest and best will in all probability draw a large attendance.

JOHN H. FLAGLER CALLED BY DEATH.

John Haldane Flagler, founder and general manager of the National Tube Co., McKeesport, Pa., died Friday, Sept. 8, in his home at Greenwich, Conn., at the age of 70, after a week's illness with pneumonia. Although he had virtually retired from business during the last few years, he retained the directorship of several organizations. In the field of finance and in iron and steel circles, Mr. Flagler was a prominent figure for nearly 40 years. His career began with Haldane & Co., New York, with whom he rose rapidly from clerk to manager of the Boston branch. In East Boston, the National Tube Co. had its beginning in 1868. Two years later it was moved to McKeesport where its extensive plants are now operated by the United States Steel Corporation, with which it was merged in 1901. Mr. Flagler contributed several improvements to the steel industry, among which was a new method of uniform heat treatment. He was also instrumental in the introduction of gas for furnace use. At the time of his death, Mr. Flagler had been director of the National Bank of North America and the American Union Line Insurance Co. Besides his wife he leaves a daughter, a sister and a brother, Harvey K. Flagler.

HEATING AND VENTILATING GOLF ASSOCIATION OF PHILADELPHIA HOLDS MEET.

Vacations over and everyone anxious to see one another again the members of the Heating and Ventilating Golf Association of Philadelphia turned out 25 strong for the September meeting which was held at the Huntingdon Valley Country Club, Noble Station, Pa., on Wed. Sept. 13, 1922. This very interesting course was secured for the association by W. Shelmerdine. Most of the players motored out so that play was started early and everyone had finished the morning round which was an 18-hole medal play, by one o'clock.

Lunch was served on the veranda of the club house and the best ball foursomes started out to play the course as it should be played in the afternoon. Tom Cooper stepped into first place with a gross score of 88 in the afternoon. He is to be complimented on his good playing.

After a nice cool shower everyone congregated on the front porch while the handicap committee decided the winners. A table was set on the open porch and a delightful supper was served after which the prizes were awarded. The next meet will be held at Tavistock Country Club which is located at Haddonfield, N. J.

The best scores in the morning round were Tom Cooper, 81; W. P. Culbert, 83; and George Gray, 92. The afternoon winners were Steward and Hedges, first, with a 74; Robinson and Rice, second, with an 81; and Strandwitz and Scott, third, with 83.

Secretary Bolsinger has secured the Tavistock Country Club course at Haddonfield, N. J., for the next meet.

CASEY HEDGES CO. TO BUILD NEAR CHATTANOOGA.

A large plant for the manufacture of boilers and other supplies used by the plumbing and heating trades, is to be established within the next few months at Chattanooga, Tenn., by the Casey Hedges Co., Mr. Hedges advising that the company has obtained a 45 acre site near that city on which the plant will be constructed.

EASTERN TRADE GOLF ENTHUSIASTS BRAVE RAIN IN TOURNAMENT.

The September tournament of the Eastern Trade Golf Association was held at the Engineer's Country Club, Roslyn, Long Island, on Tuesday, Sept. 12, 1922. There were 25 present.

President W. A. Burtenshaw secured this wonderful course for this event. At this tournament the players were divided into two classes. Those with a handicap of 18 or less were listed as members of Class A, and those with a handicap of 19 or more were listed under Class B. The various events planned for the day were the 18-hole best ball foursome in the morning and the 18-hole medal play handicap in the afternoon. Due to the heavy rain in the morning the tournament was postponed until the afternoon. D. H. Roney and D. A. McKay, T. Cochran and D. C. Chaddock were the only players who braved the rain and played 18 holes in the morning. The weather cleared temporarily at 11 o'clock in the morning and several of the players ventured forth only to give up after playing 2 holes when it started to rain harder than ever. However, after lunch the weather cleared and the tournament was on. The morning and afternoon scores were combined. The scores, on separate sheets. A wonderful dinner was served on the west porch of the club house after the afternoon round.

In Class A the winners were D. A. McKay, 74; J. G. Geoghegan, 79; T. J. O'Donnell, 83; and H. A. Call, 88. Those in Class B were H. J. Reeves, 83; E. S. White, 83; W. H. Staples, 85; and T. W. Graham, 88.

FRANK PROX CO. ERECTS NEW BUILDING.

To take care of a demand for increased production the Frank Prox Co., Terre Haute, Indiana is erecting two additions to its plant. These will take the form of 80 feet additional space to the foundry and 135 feet to the core room. The buildings will be of steel and glass construction.

BUILDING THREE NEW PLANTS.

The Ohio Injector Co., Wadsworth, Ohio, is building three additional plants which, it is estimated, will increase production 300 per cent. This company will add the manufacture of low pressure valves and fittings. The new quarters will be ready by the first of the year.

PLUMBING AND HEATING SUPPLIES REPRESENTED AT NATIONAL EXPOSITION OF CHEMICAL INDUSTRIES.

The eighth National Exposition of the Chemical Industries was held at the Grand Central Palace, New York City, the week of Sept. 11th.

B. D. Schenck of the Duriron Co., Dayton, Ohio, was elected President of the Chemical Equipment Association during the exposition. A list of the exhibitors in the plumbing and heating field included:

Duriron Co., Dayton, Ohio, soil pipe, drain pipe and fittings; Nash Engineering Co., So. Norwalk, Conn., vacuum pumps; Johns-Manville Inc., volume meter and insulating

materials and packings; United Lead Co., New York City, valves, pipes, fittings, pump, and tin and lead lined articles; Carrier Engineering Corp., Newark, N. J., air conditioning apparatus; J. L. Mott Iron Works, Trenton, N. J., acid resisting enamels; B. F. Sturtevant Co., Boston, industrial drying equipment; Lead Lined Iron Pipe Co., Wakefield, Mass., lead and tin lined valves, fittings and pipes; Lunkenheiner Co., Cincinnati, Ohio., valves and fittings; Luzerne Rubber Co., Trenton, N. J., hard rubber goods; Grinnell Co., Providence, R. I., driers, piping and pipe hangers; Crane Co., Chicago, Ill., valves and fittings and chemical apparatus; Beach-Russ Co., New York City, rotary vacuum pumps, gas boosters, water gauges, condensation pumps; The Bristol Co., Waterbury, Conn., recording instruments; Schaeffer & Budenberg Mfg. Co., Brooklyn and American Steam Gauge & Valve Mfg. Co., Boston Division, steam gauges and boiler equipment; A. W. Cash Co., Decatur, Ill., valves and fittings; Armstrong Steam Trap, Three Rivers, Mich., steam traps; American Hard Rubber Co., New York City, tank floats, tank balls and stems; New York Continental Jewell Filtration Co., model swimming pool fitted with refiltration system; L. O. Koven & Bros., Jersey City, N. J., acid tanks; Aterite Co., Inc., New York City, valves and fittings; Hassan Valve & Pump Corp., Rockland Center, N. Y., valves and pumps; Armstrong Cork and Insulator Co., Pittsburgh, Pa., insulation materials; Sarco Co., Inc., New York City, steam traps, temperature regulators, radiator traps, and thermometers; Everlasting Valve Co., Jersey City, N. J., valves; General Electric Co., Schenectady, N. Y., motors and industrial heating; The Whitlock Coil Pipe Co., Hartford, Conn., coils; Kelly Valve Co., Muskegon, Mich., valves; American Steam Pump Co., Battle Creek, Mich., pumps.

Personal Mention

Walter Walls of Walls, Owen & Stambach, Philadelphia, has returned to his office after a lengthy illness.

Howard G. Miller has been appointed Eastern Sales Manager of Germain Bros. Co., Saginaw, Mich. His New York headquarters will be at 405 Long Beach Building.

Eric Roberts

Eric Roberts, whose photo appears herewith, has been selected to represent the Speakman Company on the Pacific Coast with headquarters in Los Angeles. For the past two years he has been covering the states of Pennsylvania, Maryland and Virginia. This territory now will be covered by Henry Kratz, who has also been with the company for a number of years.

Theodore Phillips, formerly a contractor of Marion, Ind., has joined the sales force of August Buschmann & Sons, Indianapolis, with headquarters in Vincennes, Ind.

W. H. Gray has been added to the Sales Force of August Buschmann & Sons, Indianapolis, to cover eastern Indiana and part of Ohio.

Reuben N. Trane of The Trane Company, LaCrosse, Wisconsin, is in the East visiting the company's eastern offices.

Wm. P. Bailey, formerly connected with Hayes Bros., plumbing and heating contractors of Indianapolis has joined the sales force of the W. P. Whittington Co., Indianapolis.

James A. Wood of the Erie Shower Co., Erie Pa., was a visitor in New York City this week, calling on many members of the trade.

D. H. Gabel, who has been connected with the Crown Die and Tool Company for six years in the capacity of General Manager has resigned his position to take up other plans which he does not care to divulge at present.

Charles Perry of the Philadelphia office of the Standard Sanitary Mfg. Co., Pittsburgh, has been absent from work on account of illness since his return from a vacation in Maine.

Trade Literature

Dempster General Catalog.

General Catalog No. 11, from the Dempster Mill Mfg. Co., Beatrice, Nebraska, is now being distributed. This catalog supersedes all previous issues and it contains an exhaustive list of the manufactured and jobbing lines of this company. The 370 pages that comprise the book are profusely illustrated with the various articles listed and prices and terms of sale are quoted. The catalog is bound in cloth and is 6½x9 inches in size.

Utica Heater Bulletin.

The Utica Heater Co., Utica, N. Y., has ready for distribution to heating men and builders an illustrated public building bulletin which explains their product, lists and gives pictures of public buildings in which they have installed their boilers and also contains a table of capacities and dimensions.

Twenty Years Ago in "Domestic Engineering"

Saturday, September 20, 1902.

New Company Launched.—The Marsh Valve Co., of Detroit, was incorporated with E. A. Marsh, inventor of the Marsh steam pumps, at its head. The company will market a pressure regulating ball cock for which Mr. Marsh has a basic patent. They will later put out reducing and pressure regulating valves for water, steam and air.

East Meets West.—The Eastern Golf Association held its first tournament ot Fox Hills Golf Links, Staten Island, N. Y. A delegation of the Western Trade Golf Association were guests. Golf has such a humanizing effect that governments ought to establish it by law.

Something New in Kalamazoo.—The Kalamazoo Association was reorganized by S. H. Morgan of the State Association of Master Plumbers.

Familiar?—In spite of idle capital, Detroit faces the winter with a shortage in houses.

Plumbing as Health Servant.—Evansville, Ind., as a means of fighting the prevailing disease epidemic, has appointed a plumbing inspector.

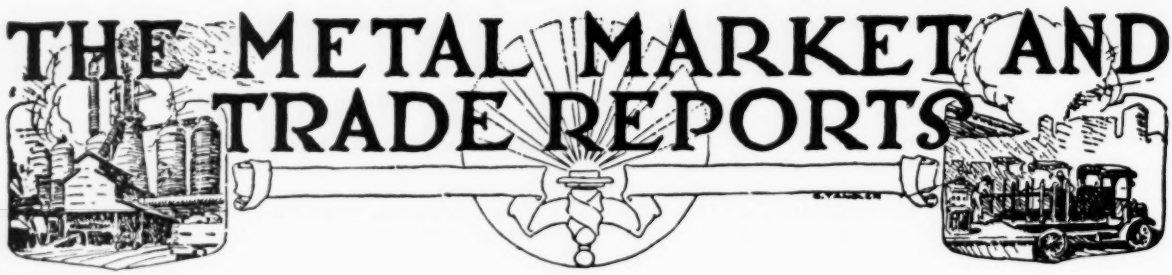
Investigation in Pasadena.—A committee studying the municipal plumbing ordinance at Pasadena, California, sent out questionnaires to the wholesale and retail plumbing dealers covering price of materials.

Change of Location.—Knott & Van Arnam Mfg. Co., Coldwater, Michigan, moved to a new factory at Fort Wayne, Indiana, which will have double the space of their former place.

Important Ruling.—Effective September 5th, manufacturers of closets have instituted an extra charge for boxes and packing for closet fixtures.

New Rate Decision.—In an agreement entered into by the Master Plumbers' Association and New York Local No. 2 of the National Union of Plumbers, a standard rate of $4.25 per eight hour day has been established, together with double rate for overtime work.

THE METAL MARKET AND TRADE REPORTS



Steel and Iron.

The collapse of the rail strike, following the ending of the textile and coal strikes, encourages the steel trade to look forward with confidence into a busy future, but does not deceive it into thinking that all its troubles are over and that great activity will ensue immediately. Leaders in the industry are proceeding with caution and in full recognition of the physical difficulties still ahead of the industry, chief among which is the low car supply.

It will require not less than six months for the industry to recover fully from the setback given it by the group of strikes. Normal functioning of all the parts of the industry is not in sight. Production depends on coal and ore supply, which still depends to a large extent on rail capacity; delivery of manufactured products depends almost absolutely upon car supply and condition of railroad motive power, excepting for a portion which can be shipped by water on the Ohio River to points in the South and Southwest. Every factor entering into the industry is yet to be brought to a normal status, which will require time, patience and wise leadership.

With the supply of coal becoming sufficient there has come a quick and large resumption of plants in the Pittsburg district. The business actually in hand is greater than at any time in the past two years and within a short time steel mills and furnaces will be hitting the stride at which they were going before the coal and shop craft strikes were precipitated. The coal scarcity was the greater of the two to cause restricted production. Although working under increased costs iron and steel manufacturers are confident that the prices will be advanced soon to give them a profit for their output. It is already intimated that the sheet steel and tin plate will be advanced soon. The price of tin per base box is $4.75 and a 50-cent increase is not out of reason.

It now appears as though the demand for steel from automobile makers is about to subside. The automobile industry has been consuming about 10 per cent of the nation's steel output. Dealers report an abrupt falling off in orders for pleasure cars which of course will soon reflect in less steel buying for automobile purposes. The shutting down of the Ford plant will also have a depressing effect. Ford will not only refrain from buying new steel for the time being but may cancel orders already placed.

Steel plant operations in the Pittsburgh district are expected to reach 70 per cent of capacity this week; at present the average is around 65 per cent.

Scarcity of materials continues to engage the attention of finished steel buyers and the past week developed an acute state of shortage in merchant bar and cold finished bar stock, with the mills declining new business for the fourth quarter as they are sold as near to capacity as they care to be.

Sheets and cold and hot rolled strip are also becoming more difficult to obtain. In the sheet market premiums have been more frequently paid over the past week than for some time. The quotations from mills in a position to accept tonnage for the remainder of the year are from 3.35c to 3.50c base. Some actual bookings, however, were made at 3.75c The galvanized sheet market is equally tight in the matter of supply for the fourth quarter.

The extreme scarcity of foundry pig iron has turned considerable attention to heavy cast scrap metal as a substitute, and has sent that material to a new high point of $22 in sales last week. Steel makers have also pressed for heavy melting steel to augment short supplies of basic iron and are facing further advances in this material. The trade paid $21 and $22 last week.

The few sales of Birmingham iron made at the end of last week were at not less than $27.50. The total booked at that figure during the week was about 4,000 tons.

Pig iron prices generally have apparently become more stable and we have heard of no price advances in the New York market. On the contrary there is a softer tendency as evidenced by the eastern Pennsylvania maker who announced a price of $32 for fourth quarter, which is $2 per ton lower than the previous quotation. Prices have been easier all through the Northeast as a result. Chicago prices have been unchanged at $32 and even charcoal iron has been stable at $33. Prices for pig iron are quoted as follows:

No. 2 foundry, Pittsburgh	$36.76
No. 2X Eastern Pennsylvania, Philadelphia	34.64 @ $36.64
No. 2 Southern, Birmingham	27.50 @ 28.00
No. 2 foundry, Chicago, furnace	32.00
Basic, valley, furnace	30.00 @ 32.50
Bessemer, Pittsburgh	34.76

Copper.

A few weeks ago it was believed in the copper trade that prevailing prices would be 14¼ cents by this time, opinions being based on the higher wages paid to labor, the diminishing surplus and the probability of the cessation of both strikes by this time which would bring out the dammed up demand for copper. But the price continues at 14 cents, and those producers who put out a test price of 14⅛ cents a few weeks ago have by now withdrawn it.

Last week was fairly satisfactory from standpoint of sales —has been good in fact when war-time sales are not used as a criterion. Lake copper sells at 14⅛ cents and casting copper at 13.45 cents to 13½ cents, refinery. Buying on the part of Germany is improving, and fair quotations are taken by both France and England. There has been nothing spectacular in copper the past week as took place in lead and zinc, for instance. where prices rose rapidly. Neither have copper prices kept pace with those of iron and steel. On the New York Metal Exchange at the end of the week electrolytic was unchanged at 13⅝ cents bid, 14 cents asked and 13⅞ cents settling price, spot to October. Standard copper was 5 points lower at 13⅜ cents bid, 13¾ cents asked and 13.45 cents settling price, spot to October.

Tin.

During the past week spot tin became easier while futures about hold their own. For instance, at London both spot standard and spot Straits tin dropped off 10s, while futures standard gained 2s 6d. Straits tin in New York was ⅛ cents lower and futures were unchanged. Sterling exchange declined about 3 cents last week. There were good sales on one day, which was Tuesday, when about 800 tons were sold. At the close of the week Straits tin was quoted in New York at 32⅛ cents to 32¼ cents. Though there was some talk of imposing a duty on tin this continues on the free list. However,

it is provided that when the production of tin ore and black oxide in the United States reaches 1,500 tons a year a duty of 4 cents per pound shall be imposed on black oxide and 6 cents per pound on bar, block and pig tin.

Lead.

Lead and zinc were the most active of the non-ferrous metals from a price standpoint during the week, both having been advanced about $2 a ton in that period. For lead paint, alloy, pipe, storage battery makers, railroads and steel companies have all been in the market. The week's close saw the price of the American Smelting & Refining Company $2 per ton higher at 6 cents, New York, and 5.80 cents, East St. Louis. In the outside market prices ranged from 6.05 cents to 6.10 cents. The European market is very strong which prevents importing lead into this country.

Zinc.

At the end of the week East St. Louis zinc prices had been advanced from 6.40 cents to 6.50 cents, though metal for delivery in November and December could be bought at 5 points lower. Several important sellers are out of the market for prompt shipments, having become sold up through September.

Other Metals.

Quotations on other metals in New York are as follows:

Aluminum in 15-ton lots, 99 and purer....20.00 cents per lb.
Antimony, Chinese brands ..... 5.25 cents per lb.

New York Old Metal Market.

The following prices are current for old metals:

	Buying	Selling
Copper, heavy	11½ to 11¾ cents	12¼ cents
Copper, light	9¾ to 10¼ cents	10½ cents
Brass, heavy	6¼ to 6¾ cents	6½ cents
Lead, heavy	4¾ to 5 cents	5¼ cents
Tea lead	3¾ to 4 cents	4¼ cents
Crucible copper	12 to 12¼ cents	12¾ cents
Zinc, new scrap	4¼ to 4½ cents	4⅞ cents

Chicago Old Metal Market.

The following are the current prices for old metals:

	Buying	Selling
Crucible copper	11½ to 11¾ cents	12 cents
Heavy copper and wire	11 to 11¼ cents	11½ cents
Light copper	9½ to 10 cents	10½ cents
Red brass	8¾ to 9 cents	9¼ cents
New brass clippings	8 to 8¼ cents	8¾ cents
Heavy yellow brass	7 to 7½ cents	7¾ cents
Light brass	5¼ to 5¾ cents	6¼ cents
Heavy lead	4¾ to 5 cents	5½ cents
Tea lead	3½ to 3¾ cents	4¼ cents
Zinc	3½ to 4 cents	4½ cents
Block tin pipe	27½ to 28 cents	28½ cents

IN THE CHICAGO SUPPLY MARKET.

Chicago, September 20.—Although jobbers in the Chicago supply market are becoming less insistent in their demands for materials to be used in connection with plumbing and heating installations, manufacturers' representatives report that practically all mills, foundries and factories are still behind in their orders, some of them, notably makers of enameled ware, as far as four months.

The leading interests in the manufacture of wrought iron pipe have announced another raise in prices, 5½ points, which is the second within the last month. Representatives of these mills point out that the first raise was necessitated by increased cost of materials, while the newest is designed to compensate for the twenty per cent wage increase that was announced some time ago. It is pointed out that the cost of labor in the manufacture of wrought iron pipe is much higher in relation to the total cost than it is in the case of steel, and for this reason manufacturers of the wrought iron product contend that the second increase was absolutely necessary. There has been a good steady demand for this material, and this has further been stimulated by the fact that makers of steel pipe are far behind in deliveries.

In the steel pipe market the demand is being upheld now by the opening of the heating season. Manufacturers are still loaded up with unfilled tonnage and are booking orders only from regular customers, and are restricting these to their actual immediate needs.

Soil pipe remains unchanged as far as price is concerned, and the general demand for this material is falling off considerably, according to representatives of various foundries. The uncertain situation created by the coal and rail strikes has had a tendency to discourage new building plans, while buildings that were started in the spring are far beyond the soil pipe stage, thus it seems that if transportation were available, soil pipe foundries would be able now to make very appreciable inroads on their unfilled orders. Even as it now stands, practically all of the principal manufacturers of this line have enough tonnage on the books to carry them through the months that are ordinarily expected to be dull, and into months when jobbers will be in the market for supplies to fill out their lines for the next building season.

Enameled ware is very active, the heavy demand for material to finish up the summer's building falling at this time. The coal shortage and the perennial summer decreased production have combined with an unusual demand to create a heavy shortage in this line. Various manufacturers are from two to four months behind in shipments, the average probably being about ninety days.

Pottery is also experiencing a good demand but there is not the shortage here that exists in the sanitary enameled ware field. With the prospects of a potters' strike staring them in the face, potteries are, in general, inclined to think that by this time they will be pretty well up in orders, there will not be an unusually large amount of new business, consequently a strike will not be as disastrous as the unions are inclined to imagine.

All materials going into installation of heating plants are in heavy demand. This includes boilers, radiation and brass specialties in this line.

IN THE PHILADELPHIA SUPPLY MARKET.

Philadelphia, Sept. 16.—The unrest which has been spreading among workers in clay products throughout the past six months, and more particularly in recent weeks, has come to its crisis in a manner gravely threatening the prosperity of both wholesale and retail plumbing supply houses this winter and making problematical from now on until November 1, or beyond, all bids covering any large quantity of pottery. The conference committees of the National Brotherhood of Operative Potters and the Sanitary Manufacturers' Association came to a deadlock yesterday, after a stormy session which set a precedent for friction between employers and employes in this trade.

Not only did the National Brotherhood of Operative Potters flatly refuse to consider an opening proposal to cut wages 25 per cent, but a compromise figure of 20 per cent was rejected, and the manufacturers were told in effect that the condition of the industry was so prosperous that the potters proposed to demand not only the full rates of pay to which they were accustomed, but amelioration in working conditions, and shifting of certain obligations of a financial sort to the employer's shoulders. These demands, in the words of Arthur Podmore, of the Camden potteries, are regarded by most of the manufacturers of sanitary ware as equivalent to a demand for about five per cent increase.

From a cost standpoint, the situation has been ticklish for some time, and the manufacturers point out the following salient facts:

Of all the skilled workmen manufacturing finished products used in building construction and finishing, the potters have enjoyed unusual immunity from recessions in wage scales which were agreed to, more or less willingly, in nearly every other line. Not only do the potters enjoy the same rate they were paid at the peak of war activity, when Government contracts on the cost-plus basis were the basis of operation in many plants, but they have been granted concessions on various pleas since the last renewal of their agreement was made effective Nov. 1, 1920.

It is pointed out that the volume of production has been entirely in the hands of the potters, rather than their employers, because they have restricted production by the simple process of working only so rapidly. This could not have been overcome by doubling shifts, as was contended by some factors in the wholesale market recently. Mr. Podmore, in denying the feasibility of such a plan, said: "You can only fill your forms and wait for them to dry over-night. Until they are dried out, you cannot do anything more, and there is no use attempting to speed up production that way. However, the potters could have been making a lot more money; they all work on piece-work. But they chose to hold back."

This holding back gave the craftsmen a strong tactical advantage over their employers at the Atlantic City meeting; both parties to the agreement knew well that November 1 would not see curernt orders any where near taken care of, since production has trailed behind consumption figures for months. Back orders would prove a strong argument, the potters reasoned, for granting, at least temporarily, almost any reasonable concession the employers might be presened with. But the Atlantic City meeting came to a sudden end; it had been a stormy one, and there were no olive branches drifting around the sand-dunes after the doors had been closed.

The practical up-shot of the situation in the market today was the withdrawal of prices by Cochran-Drugan & Company, and a little later news that the Maddock potteries were also withdrawing price-lists was confirmed. Since the matters of policy at issue were to an important extent in the hands of A. M. Maddock, the trade is at this moment very much "in the air" as to what the Maddock withdrawal portends. If a price increase, then it appears that the demands of the potters may be met, and sharp readjustments on contracts pending or already closed, are expected. An extra five per cent would make a substantial difference on many of the big jobs which have put so much life into the building situation in Philadelphia this season. Wholesalers doubt if most of the potteries would protect old business 100 per cent, if a readjustment with the potters engenders new and higher cost figures. "Subject to change without notice" is developing into a bugaboo.

If a walk-out of the potters were to take place, such a walk-out would create a vicious shortage and inevitably a wild-cat market in the spring.

Added to the news of the pottery difficulty, the increase on wrought-iron pipe this week, of about 5 points, proved another cause for concern to jobbers and contractors. Steel pipe will follow wrought iron up in a very short time, in the opinion of Mr. McCann, of John Maneeley and Company, steam supply jobbers, who considers that Philadelphia is bound to see a mid-winter recession on many kinds of supplies, in order to bring the city more nearly in line with the price-attitude of the country at large. Mr. McCann is very emphatic in asserting that the rush of business has produced an unhealthy speculative tendency in all the materials whose original lowness of price made the building boom possible; he considers that this tendency is going to defeat its own ends by checking bidding and new work, the result being that there will be a sag in the market for most building materials, after snow flies.

Nipples, a rumor of increases on which was afloat a week ago, are now priced ten per cent higher, on an average. These goods are by no means following the pace set by soil pipe, which at its lowest was down to 19, has reached 43 (for four inch), and is only 20 cents under the boom-time maximum of 63 cents. Brass goods as a whole remain in the modest violet class, due to the generally active production of copper, and competitive conditions in the industry.

Boilers and radiation are far over-booked in many lines, however. H. R. Myers of Tomlinson & Company, says that December and January schedules of delivery are now being made on 22 and 26-inch radiation which should be installed before winter comes, and that Arco boilers, among other brands, are away behind in delivery.

IN THE NEW YORK SUPPLY MARKET.

New York, N. Y., September 16th.—With the Government giving preference to the transportation of wheat and coal, manufacturers in various lines of plumbing and heating supply are finding it difficult to obtain the necessary raw materials and a condition of shortage in some commodities is reported by New York jobbers. This is accentuated by the fact that demand continues fairly active, particularly so for this time of the year.

The prediction made earlier during this season that demand would continue right through to the fall trade this year, instead of showing a period of stagnation in later August and September, is being fulfilled. The fall demand does not properly begin until the beginning of October and demand is still quite reasonably active.

Reports vary of course from individual firms, each speaking from its own experience, but in a general way all kinds of pipe are conceded to be short stocked and hard to obtain. Strikes are still reported in some of the foundries and other handicapping conditions are the coal shortage and the concentration of the railroads on hauling what are regarded as the main essentials of freight first, thereby holding up the passage of the raw material to the foundries and the passage of the finished commodities to the plumbing and heating supply jobbers. It is a very unsatisfactory situation all around.

Brass manufactured goods continue moderately active, though this market is stated to be still bedevilled by the excessive number of operators, especially at the manufacturing end. This factor has held prices below profitable levels all through the present season, and probably less money is being made in this line than in any other, according to one well-known jobber.

Pottery ware is scarce in this market and hard to get from the manufacturers for the reasons already stated. The demand is good and prices are firm, but jobbers report that the over-sold condition of the market in many quarters is having a decided tendency to handicap activity in this line.

Enamelled ware continues active, jobbers reporting a steady flow of good orders. The manager of one well-known house had a call on his desk for twelve tubs, wanted for immediate delivery, and other similar orders were coming in all the time. Prices in this line maintain the steadiness that has marked them more or less all through the present season. Some say there will be no changes made until the inventories are taken at the end of the year. Jobbers in enamelled ware were perhaps more fortunate than those handling other lines in that the price slashers were not strong enough to force quotations below the safety margin at any time.

The demand for heating equipment and repair parts continues to move slowly but steadily towards its regular fall activity. There isn't very much doing yet perhaps but the signs of coming business are there in a trickle of orders, and in the meantime there is a certain amount of business in connection with the regular building program that is going on, which incidentally has broken all records this season.

Exchanging Ideas is the Foundation of Progress

What Associations Are Doing

Through United Effort the Individual Succeeds

MANHATTAN MASTER PLUMBERS ENJOY A "PERFECT DAY."

Over Four Hundred Participate in Big Outing at Port-Au-Peck Inn, Pleasure Bay, N. J.

With perfect weather and a program that went without a hitch, the members of the Master Plumbers' Association of the City of New York, Manhattan Branch, and their friends, held their annual outing at J. C. Viemeister's Port-Au-Peck Inn, Pleasure Bay, N. J., on September 14th. By general consent it was the best outing ever staged by this organization, which enjoys the distinction of being one of the largest in the country.

There were 400 present, including members, wives, daughters, salesmen and other friends; and they pulled anchor from the Battery at 9:30 prompt in the good little ship "Little Silver," whereupon Beethoven Flynn's jazz-hounds began a tootling and the great day was started. A word of praise is due to Brother Flynn in this connection, for his efforts added much to the pleasure of the day. He and his accomplices snooped round among the boys all the time, and whenever any of the latter tried to draw breath, up crept the orchestra and set the ball rolling harder than ever.

After a pleasant 2½ hour sail down the bay and up the beautiful Shrewsbury river the "Little Silver" arrived at Pleasure Bay about 12:30 and the crowd went to breakfast on the Green at the Port-Au-Peck Inn, which is sure some little old hostelry. A good time was had by all, and anyone who says a master plumber isn't a hard worker doesn't know what he's talking about.

After breakfast the party repaired to the private baseball ground attached to the Inn, where a 5-inning baseball game was staged between the plumbers v. supply tradesmen. The game was closely contested, up until the last inning, when at that stage the plumbers shook out something they'd kept hidden up their sleeves and scuttled the supply men to the tune of 22 to 8, scoring no less than 16 runs in the last inning, in a terrific batting rampage.

Each member of the winning team received an adjustable ash-tray, given by the Manhattan Association.

Athletic Events Bring Out Real Stars.

The broad jump contest was won by N. L. Leneke and H. Vollmer, who tied, receiving respectively a stock and die donated by R. J. Donovan & Co., and a bath cock donated by Behrer & Co.

The badger game, which was the cause of considerable merriment, was won by B. Kornblum, master plumber, although that wasn't what the promoters of this contest intended. "Brother" Kornblum was chosen to pull the string that should let the badger out of the barrel, and when he did so he got away to such a good start that the local associations right across New Jersey thought he was a visiting delegate; whereas the members who had gathered under the tree to see Kornblum quizzically queered received the whole pail of water on their own heads.

The 100-yard dash was won by R. F. Brown and J. A. Edwards, who received respectively a stock and die donated by R. J. Donovan & Co., and one dozen packless valves donated by Pierce, Butler & Pierce Manufacturing Corp.

The hop, step and a jump was won by Ray C. Smith, who received a bath cock, donated by the Union Rubber Products Corporation; B. M. Friedman getting a second prize of a bath cock donated by Behrer & Co.

At the Manhattan Outing. Upper Row: William T. Hannegan, Chairman of the Outing Committee; Start of the Three-Legged Race; B. Kornblum; Group of Master Plumbers and Wives. Lower Row: Members of the Outing Committee; William Young, Said to Be the Oldest Living Plumber; Start of the Potato Race; and M. J. Kennedy, President of New York State Association of Master Plumbers.

The three-legged race was won by the J. J. Hassett-J. R. Spillman team, who received repair kits donated by the Good Manufacturing Co.; the Gienow-Walker team tying in the first heat but losing the run-off.

The egg race, for ladies, was won by Mrs. M. Hepburn, who received an electric iron; the second prize of a compass saw, donated by the Union Rubber Products Corporation, going to Mrs. Richard Tretler.

The potato race went to A. Gienow, who received a stock and die donated by the Union Rubber Products Corporation; George Melcher coming in second and receiving a water heater donated by the Excelso Specialty Works of Buffalo, N. Y.

The shot put was won by P. J. Drew who received a soap dish and faucet combination donated by the Union Rubber Products Corporation; M. De Nat, second best, getting a rotary hack saw, donated by the Excelso Specialty Works, Buffalo.

The tug of war was the cause of much excitement. The plumbers were represented by P. J. Drew, anchor, assisted by T. Dunn, John Hassett, H. Vollmer, N. R. Leneke, and John Weil; and the salesmen by Mr. Ryan, anchor, assisted by Messrs. Murphy, Gienow, Gore, Parry and Carr. Once more the supply men were taken over, the winning plumbers receiving each one pair of pliers donated by the Union Rubber Products Corporation.

The bottle race, for ladies, was won by Mrs. George J. Simons, who received a stock and die donated by the Union Rubber Products Corporation; Mrs. Conklin, second, getting one dozen tank balls, donated by the same firm.

The prizes were distributed during the voyage home, with all the enthusiasm and merriment that attends such functions; and a toaster, given by the Pittsburgh Meter Co. was drawn for and won by John D. Cooley. This event was confined to men only, the ladies getting their chance at a lady's bag given by the Central Foundry Co., this being won by Mrs. M. Hepburn, daughter of the popular president of the Manhattan Association, Wm. Thompson.

After the sports the members adjourned to the Inn, where a clambake contest was staged very successfully, over 400 winners being registered. The party then made its way back to the "Little Silver," and the voyage home began.

A great deal of praise was given to Wm. Hannegan and the other members of the Outing Committee for their untiring work towards the success of the affair, which, it was generally conceded, had set a record hard to beat. This opinion was also expressed by the numerous visitors from other associations and others, who included Samuel F. Wilson, Newark, vice-president of National Association; Matt J. Kennedy, president of the New York State Association; Stephen Welch, financial secretary of the Bronx Association and delegate from Zone 2; Fred Schmalstich, president of the Bronx Association; J. J. Dickson, secretary of the New York State Association; J. F. Rogers, delegate from Zone 1; Walter Heap, president of the Richmond Association; also A. Taaffe, of Newark, and many others. An interesting visitor was William Young, one of the oldest living plumbers in the United States. This spry old gentleman is 88 years of age. He learned his trade as far back as 1851 and went in business in 1862, retiring 8 years ago.

During the different events of the day the orchestra supplied music in the dance hall where many enjoyed themselves dancing and playing cards, etc.

Several groups of plumbers, who apparently were out for everything in the way of sports took an opportunity to ride in an aeroplane that was stationed in a field close by. The sight of the plane hovering over the field while the athletic events were being contested had its fascinating effect. A group of 5 plumbers who decided they wanted to reach New York City in a hurry left in a hydroplane just as the

At the Jersey City Outing.—Upper Row: Group of Salesmen Attending. J. A. Sprouls, Past State President; R. Entwistle, President of Jersey City Association; J. J. Corcoran, 3d State Vice-President; and C. Werner, Trustee. Start of the Boys' Race. Second Row: Start of the Potato Race; A Family Group; Ready for the Balloon Race. Lower Row: Start of the Sack Race; Group of Ladies in Attendance; A. R. Milne, of Abram Cox Stove Co.; G. M. Dunn, of Union Rubber Products Corporation; H. A. Boyle, Lovekin Water Heater Co.; V. E. Sumwalt, Abram Cox Stove Co.; H. Blauman, Excelso Specialty Works; M. Greenbaum, of Burt Water Heater Co.; and E. J. Bredehoft, of Whitlock Coil Pipe Co.

"Little Silver" started on its homeward journey and that coupled with several salutes from a miniature cannon by the home guard at Viemeister's wound up a most successful stay at Port-Au-Peck Inn.

The outing committee consisted of: Wm. T. Hannegan, chairman; F. A. McConnell, treasurer; Wm. J. Conklin, Richard Tretler, Hugh M. Taylor, Geo. W. Klute, John J. Falihee, Wm. Thompson, Thos. P. McLoughlin.

LYNN MASTER PLUMBERS TO HOLD OUTING.

On Thursday, September 28th, members of the Lynn, Massachusetts, Master Plumbers' Association will stage their tenth annual outing at Wardhurst, Lynnfield. The outing committee, G. E. Ryan, J. B. Feehan, Fred K. Tobin and S. H. Pool, have planned a ball game in the morning and general sports to follow the dinner.

JERSEY CITY OUTING WELL ATTENDED.

The Jersey City Master Plumbers' Association held its annual outing on Saturday, Sept. 9th, at Doeers Park, Maplewood, N. J.

Bergen Square, Jersey City, was selected as the meeting place where all automobiles assembled ready for the drive to Maplewood. Over 50 cars decorated for the occasion lined up and the committee found it necessary to get several large busses to carry those who were unable to squeeze in the automobiles. The final "let's go" was sounded and the day of fun and sport started. The threatening weather of the morning failed to discourage any of the members for on the arrival at the park the line of automobiles was cheered by many who had arrived earlier. After everybody had become acquainted the "Hot Dog Stand" drew a big crowd and the boys behind the counter, thanks to their experiences in the army, handled the situation with ease. Sandwiches and refreshments were to be had at all times during the day.

After a light luncheon the committee started the ball rolling by announcing that the ball game was ready to start. The teams lined up with Edge and McIntyre, the battery for the plumbers and Gruenwald and Scherre for the salesmen.

It was evident from the start that the plumbers had practiced for the game as the minute Umpire Sprouls announced the batteries and said "play ball" they were on their toes like real champions. The salesmen won the toss and batted first, scoring 3 runs. The master plumbers then proceeded to bat around and score 7 runs before a man was out. When the first inning was over the score stood at 9 to 3 favor the plumbers. At the end of 5 innings the agreed length of the game the plumbers were on the long end of a score of 21 to 11.

After the ball game the races were in order.

Peter Joest and Val Werner received $1.00 apiece for being the fastest three-legged pair.

Alex G. McIntyre won the prize in the backward race for plumbers.

John M. Moynihan of Bridgeman Co., proved to be the speediest fat man and won an Eversharp pencil.

Bee Russell received an Eversharp pencil for winning the potato race for women.

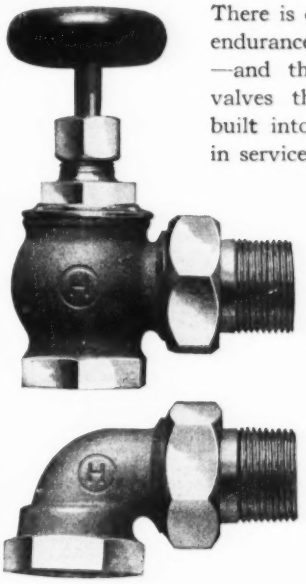
C. Henry won the salesman's race and received a box of cigars.

The sack race was won by W. Lillis, and the peanut race for women by Mrs. J. O'Neil.

After the races the crowd was given a treat in a four round boxing exhibition put on by Henry Feury and Edward Feury, brothers, weighing 58 lbs. Andrew Curry proved to be an efficient referee of this match.

After the bout the familiar call to dinner was welcomed and over 300 sat down to a wonderful chicken dinner. During dinner the Montgomery Plumbing Supply Co. presented each lady with a powder case.

ENDURANCE



There is only one way to get endurance in radiator valves —and that way is to buy valves that have the stuff built into them to stand up in service—year after year.

Hammond Valves *have* the stuff in them that insures endurance. No contractors reputation ever suffered from the service they give. Their first cost is their last cost, and it takes no longer to install them than other valves.

Made in all standard patterns and sizes for steam and hot water.

Your jobber can supply you. Specify Hammond Valves.

Hammond Brass Works

Hammond, Indiana

Is It Possible—

To have an ample supply of running water at a LOW COST?

It IS possible, if you have a "UNIFLOW" Domestic Water System.

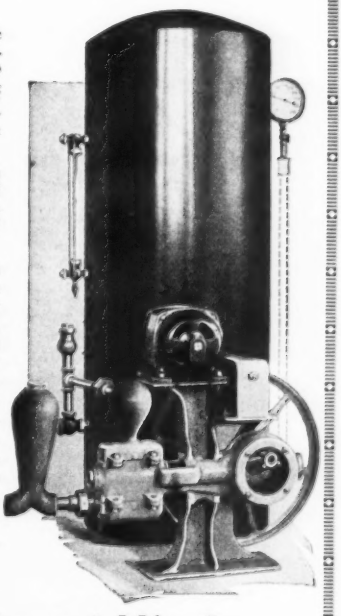
Just think, you can pump 1,800 gallons of water for the TRIFLING cost of 2 KW of power.

A family of five is now supplied with a PLENTIFUL supply of soft water for bath, lavatory, kitchen and laundry for less than 18c per month by a "UNIFLOW" System.

Because it uses so LITTLE electric current, it is by far the BEST to use with farm lighting plants.

Dealers get the facts.

Then get the business.



Write today to the

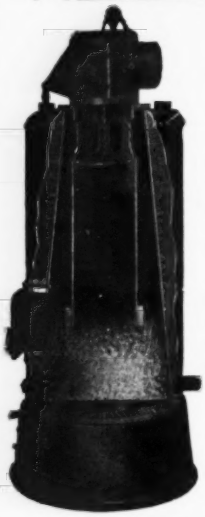
Uniflow Pump & Mfg. Co.

427 Valley Street **Tel. East 47**

DAYTON, OHIO

Every Essential for Highest Efficiency is embodied in

WILKS Water Heaters



The advantages of steel heaters over cast iron are too well known to require emphasis.

WILKS Heaters are constructed of best quality steel, strongly riveted and calked. Will not crack or leak. Water circulates in vertical direction—the natural way for heat to move water.

Made in a wide range of sizes—from the small surface burners to large self-feeding type. You'll find them suitable for any job.

Write for catalog covering the WILKS line of Water Heaters, Garbage Burners, Garage Heaters, and Steel Tanks for Every Purpose.

S. WILKS MFG. CO.
3517 Shields Avenue, Chicago, Ill.
EDWIN W. SEDGWICK, President
HARRY M. SEDGWICK, Sec. and Treas.

The Climax Cellar Drainer

Why use uncertain and costly waterproofing of cement, asphalt, tar, etc., when the CLIMAX Cellar Drainer is so positive, dependable and inexpensive? The CLIMAX is usually installed in the end, why try something else in the beginning?

THE C.M. KEMP MFG. CO.
405-413 E. OLIVER STREET
BALTIMORE, MD

Pacific Coast Agents: Wm. P. Horn Co.
Rialto Building, San Francisco, Cal.
Kerchoff Building, Los Angeles, Cal.
Deekum Building, Portland, Ore.
L. C. Smith Building, Seattle, Wash.

After dinner a broom ball game was started and the master plumbers were again successful over the salesmen to the tune of a 9 to 8 score. The out shining star proved to be Henry Cohendet.

Then the wheel barrel game was in order. This game certainly requires plenty of sense of direction, for almost every one who entered found they were closer to the objective when they started than when they finished.

The committee then announced that the prizes would be awarded inside the dancing pavilion and everybody proceeded to the hall. The winners of the various races were then presented with their prizes.

Next was a drawing for the ladies. 1st prize won by Mrs. H. Sharrock. Prize Complete Bathroom Accessory outfit donated by J. D. Johnson; 2nd prize won by Mrs. S. Mair, set of Lingerie Pins; 3rd prize won by Mrs. O'Neil, Ladies' Umbrella; 4th prize won by Mrs. I. Brennan, Cut Glass Dish; 5th prize won by Mrs. H. Cohendet, Ladies Pocket Book.

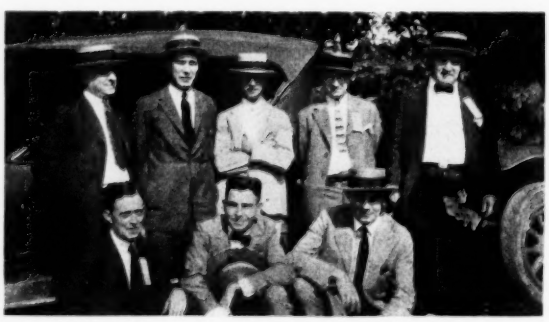
Next was a drawing for the salesmen's prize. 1st prize won by H. P. Chaub, Umbrella; 2nd prize won by W. S. Jellerson, Box of Cigars.

Next was the master plumbers' prize distribution. All of the prizes donated were listed on a chart and the winners picked what they wanted. When the last prize was picked it was well on in the evening and everybody departed for home having spent a glorious day at one of the best outings ever held by Jersey City Association. The committee consisting of: J. T. Brennan, chairman; J. J. Corcoran, Henry Cohendet, J. T. Edge, C. Werner and R. Entwistle, come in for a good deal of praise and credit for their efforts and the outing showed plenty of hard work on their part by the smoothness with which it was carried out.

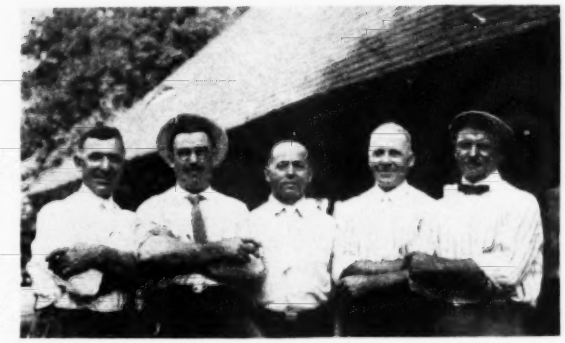
The outing was honored by the presence of several of the state and national officers among whom were Sam R. Wilson, of Newark, vice-president of the National Association; and Frank Fell of Trenton, N. J., president of the National Association.

BROOKLYN MASTER PLUMBERS' ASSOCIATION HOLDS ANNUAL DINNER.

The Master Plumbers' Association of Brooklyn, N. Y., held its second annual dinner and dance at the Bay Plaza Hotel, on the evening of Tuesday, September 14, with about 300 members, ladies and guests present. Dinner was served at 7:30 and from then on there was always something doing. Between courses there was dancing, and singing of songs, old and new, with a song-leader so full of pep that he had to be held to give the crowd a chance to eat. And there certainly was an abundance of good things,—clam chowder, steamed clams, clam broth, blue-fish, eels, lobster, chicken, corn on the cob, watermelon, ice-cream, cake and coffee. The song-leader gave exercises with some of the songs to help the progress of digestion, and make it possible to go through to the end.



Some of the Salesmen in Attendance at the Recent Outing of the Pittsburgh Master Plumbers.



Members of the Entertainment Committee at the Kansas City Outing. They are E. A. Kuebler, D. E. Justus, J. S. Levene, W. W. Preston, and Herman Hampel.

There was little speech-making as this was a "get-together" party and jollification. Cornelius Sheehan, Deputy Commissioner of Water Supply, Gas and Electricity expressed his gratification at being present. Albert F. Kleinert, Superintendent of Buildings said that if they had as little trouble with the other building trades as they did with plumbers, his department would have less to do. He also called attention to the fact that plumbers were the only ones required to have licenses, and stated that this should be required of the others. Assistant District Attorney Hock, for 14 years a plumber, before he entered law, drew some comparisons between the plumbing business as he knew it and as it is today. He stated that in five years of prosecuting persons from all walks of life, he had never had occasion to act against a plumber. President Wm. Wolff spoke a few words of welcome and appreciation, after which the rest of the evening was spent in dancing.

Among those present were Supt. of Buildings, Albert E. Kleinert; Deputy Commissioner of Water Supply, Gas and Electricity; James Swayne, Wm. Dineen and others from the Water Dept.; M. J. McGrath, Chairman of the Board of Examiners; Wm. Thompson, President and Wm. Hannegan, Secretary, of the Manhattan Association; Fred Schmalstich, President, S. Welch, Financial Secretary and A. Beyrodt, Secretary, of the Bronx Association; Wm. Heap, President and Joseph Elliott, Secretary of the Richmond Association; John F. Rogers, Delegate of zone 1; and State Secretary John J. Dixon. M. J. Kennedy, President of the N. Y. State Assn.

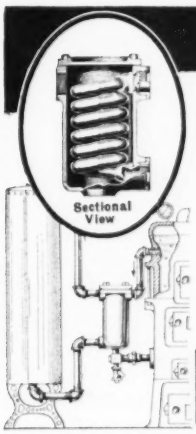
The committee, which was much praised for the fine arrangements consisted of M. J. Kennedy, Chairman; M. J. McGrath, T. Frisse, J. J. Dixon, J. Jarcho, T. E. O'Brien, T. W. Edgerton, T. A. Deiser, C. H. Mentzinger, and the President, Wm. Wolff, Ex-officio.

ASSOCIATION HOLDS ANNUAL OUTING.

The annual clam bake and outing of the Westfield Master Plumbers' Association of Westfield, Mass., was held at Still Pond in that town Aug. 29. There were about 35 members and guests present and after the clam bake, a program of sports and social time was enjoyed.

TO BE HAPPY.

The above is the heading of a neat display in the center of the newspaper advertising of the Portland Gas & Coke Co., at Portland, Oregon. Then the display goes on to say, "To be happy one needs a good laugh now and then. The booklet, 'The Story of the Bath,' is one of the cleverest things written. The cost is 25c, but we have 100 copies for the first 100 ladies who call up. Mailed free. Glad to anticipate your happy smile as you peruse it."



HOT WATER
At Lowest Possible Cost

EXCELSO Heaters are easy to get! Order yours with your other heating supplies. Endorsed and sold by **every prominent boiler manufacturer** and by **all plumbing and heating supply jobbers.**

Remember, the Excelso is the one nationally-advertised, most widely distributed water heater of its kind. **Eliminates fire pot coils.**

Write for details and liberal discounts.

EXCELSO SPECIALTY WORKS
111 Clinton St., Buffalo, N. Y.

N. Y. City Sales Rep., John G. Kelly, 137 E. 43rd St.
New England Rep., Daniel L. Hanson, 46 Cornhill, Boston, Mass.

EXCELSO

NO ROOF IS SUPERIOR TO ITS FLANGE

Therefore, some PLUMBER is the father of every leaky roof.

The Bullard Roof Flange

is acknowledged as the only PERFECT FLANGE by busy men who have made satisfying installations.

THE BULLARD SPECIALTY CO., Tiffin, Ohio

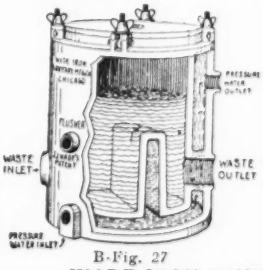
SQUARE G "GEE" Malleable Iron Pipe FITTINGS

Are you using the Costalog?

It's a handy little booklet you can have free, if you will write for it.

THE GRABLER MANUFACTURING CO.
CLEVELAND, O.

WADE Water Jacket Grease Trap



B-Fig. 27

The unusual success of this trap is due to the special design and working principle. Entire body, walls and center partition surrounded by cold water. Grease congeals as soon as it enters trap and floats to top where cleanout cover permits easy removal.

Used largely under kitchen sinks in hotels, clubs, etc.

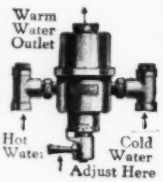
WRITE FOR CATALOG.

WADE IRON SANITARY MFG. CO.
551 W. Fulton Street, Chicago

TABASCO

A water heater *built of steel* that stays on the job for keeps. There is profit in them for you.

KEWANEE BOILER COMPANY
Kewanee, Ill.



For Shower Baths and Hot Water Lines—

Wherever hot water is supplied it should be so controlled that there is no danger of scalding. Extremely hot water, furthermore, is not only wasteful of fuel, but detrimental to plumbing.

The Powers Controller, on hot water lines to lavatories, showers, etc., prevents too hot water from passing.

It prevents shock to the user, from either too hot or too cold water. Thermostatically controlled, it is entirely automatic in operation. Saves fuel, water and time.

Ask for Bulletin 124

THE POWERS REGULATOR CO.
Specialists in Automatic Heat Control

2716 Greenview Av., CHICAGO Offices in 28 Other cities
NEW YORK BOSTON TORONTO
Consult Your Telephone Directory

(1379B)

The extension table, made of sheet metal, shown in illustration can be detached and attached to any bench with two bolts.

More Profits

with less efforts are being obtained by using our Standard Portable vise bench and pipe bender. Set up in a minute. Nothing to take apart or put together. Several improvements. You will be well repaid if you will drop us a line for catalogue and list of hundreds of satisfied users.

Write now

Standard Iron Works Inc.
508-10 E. 74th St. New York City

TESTITE

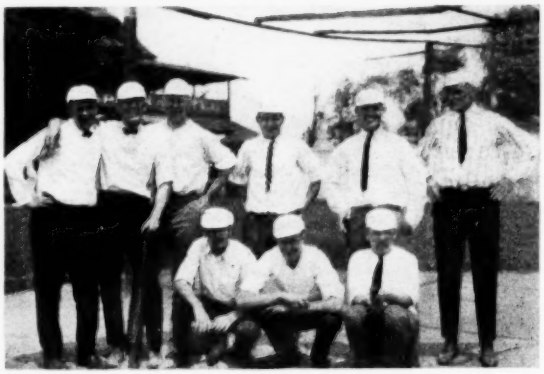
CLOSET CONNECTIONS

ADJUSTABLE
ECONOMICAL
EFFICIENT
CONSISTENT
LABOR SAVING
MATERIAL SAVING
} YES

—*and*—

Cheaper than the old inconsistent putty, plaster paris or cement method of making closet connections.

THE GROENIGER MANUFACTURING COMPANY
8 East Chestnut Street Columbus, Ohio



Members of the Baseball Team at the Bayonne, N. J., Outing. From Domestic Engineering Photo.

CAMDEN MEMBERSHIP DRIVE LAUNCHED.

The Camden Association of Master Plumbers has launched a membership drive with the idea of increasing its active roll by fifty per cent, or up to about 75 members, by the date of their November meeting. The projected drive was gotten under way at a meeting of the Association held in the Camden Chamber of Commerce building September 15, at which plans for the expansion of the trade's quasi-public, as well as purely business activities, were discussed.

Lionel C. Simpson, President, and W. Bradford Williams, of the publicity committee, were chosen captains of rival membership teams, the rank and file of which were made up by allotment between the two captains, at a secret drawing. Their identification with the winning or losing team will come out plainly enough when the final results are turned in, however, as the losers have to "feed" the winners at a celebration dinner. At this dinner, Mr. Simpson said, he expected to be able to count in the Association's membership fully 75 per cent of the registered plumbing trade of Camden.

Inasmuch as activities among the Camden trade have been comparatively quiet this Summer, the real estate and general building activity there lagging behind that of Philadelphia, the membership drive was decided upon as a wise procedure preparatory to establishing a joint show room for the Association, in the quarters now occupied by Mr. Simpson. While certain financing corporations have already agreed to underwrite the conducting of this showroom on an installment basis, in order to get paying volume in return for the members' investment, the Association thought better to get all the plumbers possible "in on" the expense of taking over the showroom, and it is expected that by the time of the October meeting, to be held the first week of that month, the showroom project will be ripe.

LOUISVILLE ASSOCIATION HAS NEW FULL TIME SECRETARY.

The Louisville Master Plumbers Association, following the plan used in some of the larger cities, has employed a full time paid secretary, W. F. Bridgers, who will look after all meetings, attend to all association matters and see that all correspondence is promptly attended to. There will probably be a credit information bureau established. The secretary also calls on prospective members and expects in this way to build up the membership materially. Members will also place in his hands past due accounts on which action has been impossible, and these, if collectable, will be handled on a percentage basis, with the association getting the percentage for collecting. Any complaints of members on any subject will be filed with the secretary. Heretofore with one of the

members acting as secretary, and probably very busy with his own business, the office never received the attention that it should have, nor was it possible to undertake a lot of things that will be possible with a full time employe.

Mr. Bridgers was with the service department of the Louisville Water Co., for over twenty years. He was later in the real estate business for a short time. Through his years of connection with the water company he knows practically all of the plumbers well, and while he has never been in the plumbing business he is quite familiar with it.

TEES AND SHORT BENDS TABOOED IN HUNTINGTON, W. VA.

Warning that T's and short bends must not be used in plumbing work in Huntington, W. Va., was given by A. C. Reinwald, city plumbing inspector. Notice was also given that rain leaders installed should be equipped with traps to prevent escape of sewer gas. Among the improvements in plumbing during the month was elimination of many vent pipes through the roofs of dwelling houses, Mr. Reinwald said. In the greater number of houses one vent is sufficient, and the beauty of dwelling houses is frequently impaired by three or four pipes projecting through the roofs.

SET DATE FOR OHIO CONVENTION.

At the recent meeting of the Board of Directors of the Ohio State Association of Master Plumbers, it was decided that the state convention in Cincinnati should be held February 6-7-8, E. B. Ellen, secretary, states. It was also decided that the Hotel Gibson should be headquarters for the convention.

OMAHA PLUMBING AND HEATING RECOVERING FROM SLUMP.

After a slump in the plumbing industry lasting over a period of thirty days, the past week has witnessed considerable activity and a bright outlook for the fall months. The settlement of the coal strike, railroad strike adjustment, and the assurance of a normal corn crop, for a time seriously threatened, have contributed to the renewed activity.

The threatened economic stagnation caused three large business establishments now under construction to be checked, as well as the curtailment of several hundred residences. With the industrial adjustment the plumbing and heating industry of Omaha expects an unusually active season during the fall and winter months.

An additional stimulus to the plumbing trade has been added by the recent cold spell which has just begun, and the prophecy of still colder weather for the coming week.

A Group of the Ladies in Attendance at the Recent St. Louis Outing. From Domestic Engineering Photo.

Reliable Sanitary Floor Drains

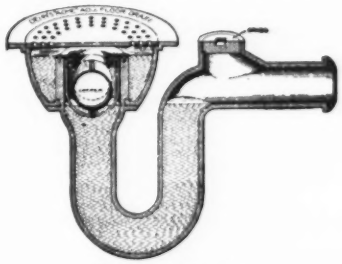


Fig. 7—Patented

Dehn's *"AcmE"* Deep Seal Continuous Pipe Trap Floor Drain with Automatic Back Water Valve.

Approved and recommended by all Departments of Health and Sanitary Engineers. These have stood the test for many years.

Beware of the Infringer and Imitator with his contraptions.

We manufacture a full and complete line of Floor Drains for every type of installation.

Catalog free upon request

Compound Injector & Specialty Co.

Established 1897

Originators, Designers and Sole Manufacturers of

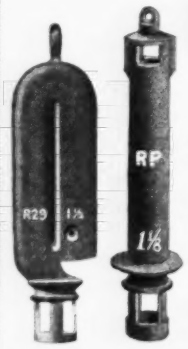
DEHNSANIGARD
THE QUALITY GOODS

419-421-D North Laramie Ave., Chicago, U. S. A.

Somerville
(S. I. W.)

Soil Pipe and Fittings

Cost no more than the ordinary kind



RIVERSIDE
GALVANIZED
CAST IRON SYPHONS

Represent the highest standard of workmanship and quality of material.

We make a complete line of all styles and sizes, including cross bars and levers.

Catalog 9 illustrates and describes the Riverside Line—write for it.

Riverside Foundry & Galvanizing Co.
500 Harrison St. Kalamazoo, Mich.

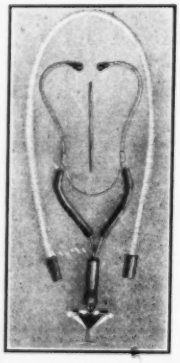
PLENTY OF
HOT WATER
NO EXTRA EXPENSE

EASILY connected to outside of steam, vapor or hot water boiler; does away with fuel-wasting coil in fire pot. Uses surplus heat of boiler. Does not overheat or underheat. Will not burn out, once installed.

An unusual opportunity for live dealers. Order now and be prepared for the demand being created. We furnish co-operation and practical sales helps to give you full benefit of our national advertising.

Write for full details
THE HOTSTREAM HEATER CO.
"Makers of Heaters that Heat"
The Hotstream CLEVELAND, Ohio
We also make a complete line of Gas and Kerosene Water Heaters.
INDIRECT WATER HEATER

"Mon-Seal"
CHICAGO POTTERY CO.
Specializes
In the manufacture of
Closet Bowls and Tanks
of "Whitest Vitrified China"
1924-40 CLYBOURN AVENUE
CHICAGO



Transmit-O-Phone

Why dig up half the street, sidewalk or cellar looking for leaking or hidden pipes. Use this instrument and find their exact location.

Price $6 Prepaid

O'Donnell Specialty Company
93 Lexington Avenue
New York

APPRENTICESHIP CAMPAIGN LAUNCHED.

The National Trade Extension Bureau has fired the opening gun in the campaign for more apprentices, and consequently more journeymen, in the plumbing trade, in the mailing out of circulars, booklets and window posters to every plumbing contractor in the United States.

The first part of the campaign, as it is now under way, is designed to attract the attention of boys and of parents, in the hope that it will influence a large number of higher grade, ambitious boys to enter into plumbing apprenticeship.

"Wanted Real Boys," is the heading of a poster that is to be placed in all of the shop windows where boys are really wanted. The text of the poster sets forth in a few well chosen paragraphs the advantages of the plumbing trade as compared to other sometimes more popular vocations.

The booklet "A Business Future For American Boys," is a message to parents of boys and is designed to enlist their aid in the problem of securing the right kind of material for the future of the plumbing business. The booklet tells briefly of the wages that are averaged in many different walks of life, showing that a plumbers' salary compares very favorably with any of them. It also touches on the great amount of sanitary work that is to be done pointing out that through the trade of plumbing an avenue of real service to the country is opened.

In order that the Bureau may have accurate statistics of the plumbing and heating business, and so that it may follow closely the results of its campaign, it has sent out postals that are to be marked and returned, with various information of a statistical nature. The data sought for is essential to the successful conducting of the campaign and the bureau wishes to urge the necessity of filling out and returning the cards at once.

EVENING TRADE SCHOOL COURSES OPEN.

Robert H. Pflug-Felder, secretary of the Master Plumbers' Association of Philadelphia, has recently sent a communication to all members of the association urging them to encourage any likely boys in their employ to take up the courses in the Philadelphia Evening Trade Schools, registration for which started September 18th. The classes in plumbing will meet three nights a week, two hour sessions, from September to March. The shop work will cover wiping and other practical work, while in the classroom will be given lectures on theory and practice of the trade together with related mathematics, science, drawing and estimating.

SEWAGE DISPOSAL PLANT PLANNED.

The city of Fort Worth, Texas, plans construction of a sewage disposal plant. Bids will be received until September 26th. Plans are in the office of the City Engineer. The estimated cost is $600,000.

PROBLEMS IN HOT WATER HEATING.

(Continued from Page 534)

at least 1 inch in each ten feet of length, and ordinarily the branches should have double this amount of pitch. This is essential to provide for quick and easy circulation.

A rather unique method of connecting the expansion tank is shown by a detail inserted on one of correspondent's sketches. This we illustrate by Fig. 7. Under ordinary circumstances the bottom of the expansion tank should be about 30 inches above the highest radiator. In this case the large tank installed will make up for the inefficient height.

Correspondent's ideas as to the manner of remedying the trouble, as set forth at the end of his letter, shows that he has a very good idea of what is required. However, a 1,700 ft. boiler is not required if the same is honestly rated. Also, in putting the work under a pressure, it will be well to use one of the recognized safe accelerating devices now to be had. It is poor policy to use an ordinary safety valve for this purpose.

A study of the sketches and letter submitted will be interesting and of great value to those who are installing heating work, either as a fitter or heating contractor.

COMMITTEE WORKING ON STANDARD VENTILATING CODE.

Mr. Sidney J. Williams, chief engineer of the National Safety Council, is heading the American Engineering Standards Committee which is working on a code for ventilation of public and semi-public buildings. The code was drawn up and submitted by the American Society of Heating and Ventilating Engineers, and is the result of many requests from all parts of the country. The code deals, in its first section, with all classes of buildings, and in the remaining three sections with schools, colleges, factories and theatres. Illinois, Indiana, Kansas, Massachusetts, Minnesota, New Jersey, New York, Ohio, Pennsylvania, Utah, Virginia and Wisconsin are now using portions of the code.

NOVEL SHOWER DISPLAY IN DETROIT ATTRACTS ATTENTION.

One of the most talked-of and unique advertising displays ever presented to the public is the one on East Grand Boulevard, a few blocks from Woodward avenue, the principal street of Detroit.

It consists of a weather-proof booth, so designed as to give the appearance of a bathroom and shows the waxen figure of a woman engaged in taking a shower-bath. The display is prominently located on a piece of vacant property on East Grand Boulevard, a thoroughfare noted for its density of traffic. Thousands of pedestrians pass the display daily and the motor traffic during the morning and evening rush hours is estimated at 22,000 cars per hour. The booth is illuminated at night by means of two large nitrogen flood lamps in addition to two small wall lamps, which are a part of the bathroom equipment.

The display features a shower made in Ann Arbor, Michigan, by the McClure Company, and the booth and display were designed and erected by the George M. Savage Advertising Company, of Detroit. As may be seen from the accompanying photograph, neither the name of the manufacturer nor the advertising agency appears on the display. Save for a small placard pasted on the extreme right of the plate glass, and listing the distributors in Detroit, there is no other advertising aside from the two signs showing in the photograph. This display proves conclusively that the plumbing and sanitary trades have much that can be utilized in outdoor advertising and that the same can so be conceived as to be most impressive.

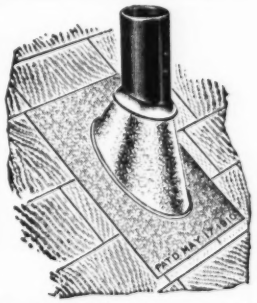
Plate Specialists
FOR THE PAST 30 YEARS

We take care of your wants

Plates in all sizes and styles. Send us your order for prompt, or future delivery and be ready for the rush.

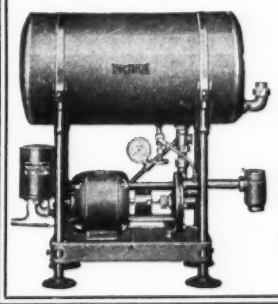
No. 10 Steel

THE BEATON & CORBIN MFG. CO.
SOUTHINGTON, CONN.
The Old Original Company



Don't Be Content
With Ordinary Roof Flashings
Specify and Use the Reliable
"SIMPLEX"
Made in All Lead—Copper—Galvanized Iron
Every Flashing Adjustable
Every Flashing Perfect
Manufactured only by
Simplex Mfg. Company, 213 W. Austin Ave., Chicago
Canadian Representative:
W. H. Cunningham & Hill, Ltd., Toronto, Ont.
New York Representative, John G. Kelly, 137 E. 43rd Street

Complete Water System
200 Gallon Pump

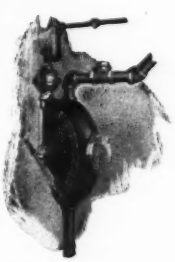


$135.00 LIST

New prices and discounts on all sizes Burks Pumps.

Write for Bulletin No. 79

DECATUR PUMP CO.
Decatur, Illinois



The
WILEY SAFETY VENT VAPOR REGULATOR

Provides the best

LIFE AND ACCIDENT INSURANCE for your vapor heating boiler

A peerless quality product manufactured and sold exclusively by

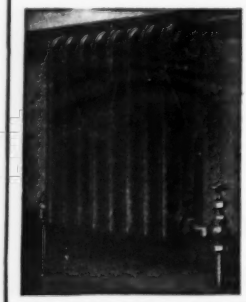
The Simplex Heating Specialty Co., Inc.
Lynchburg, Va.

A LEAD Product *for* Every LEAD Purpose

Lead Pipe—Lead Wool
Lead Tubing—Lead Roof Flanges
Lead Spun Acid Bottles—Refined Caulking Lead
Plumbers Lead Fittings—Bar Ribbon Ingot Lead
Bar Tape Wire So'der—Babbitt and Type Metals
White and Red Lead—Block Tin Pipe
Bar and Pig Tin—Pig Lead

THE EAGLE-PICHER LEAD CO.
JOPLIN CINCINNATI CHICAGO

HARTMANN
RADIATOR BRACKETS



WHY?

LABOR SAVED
NO WALL STRIPS
NO BREAKAGE
NO DIRT
INEXPENSIVE

Send for Descriptive Circular and Price List

CHARLES HARTMANN CO.
Sheet Metal Constructors
985 Dean St., Brooklyn, N. Y.

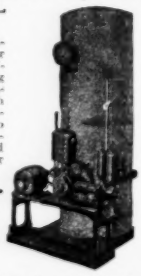
Can You Afford to Sell any Water System Without These PAUL Features?

Send for free booklet on water system installation

Fool-proof pump and controller—Self-priming (air-compressing) pump—No "snifter valves"—Self-adjusting packing—No stuffing box—Non-corroding pump-lining throughout—Two point crank shaft suspension—All working parts accessible with one-size wrench—Self-lubricating, self-adjusting, automatic operation, requiring no tinkering or attention. These Paul features make Paul operation positive and certain without the owner's attention or costly "free service" from your shop.

Ft. Wayne Engineering & Mfg. Co.
1706 N. Harrison St., Ft. Wayne, Ind.

Service Offices, carrying systems in stock: New York, Philadelphia, Boston, Minneapolis, Portland, Ore., Kansas City, Mo. Also service offices at Buffalo, Providence, R. I., Pontiac, Mich., Peoria, Ill., Madison, Wis., Wilson, N. C., Omaha, Neb.



WATER PAUL SYSTEMS

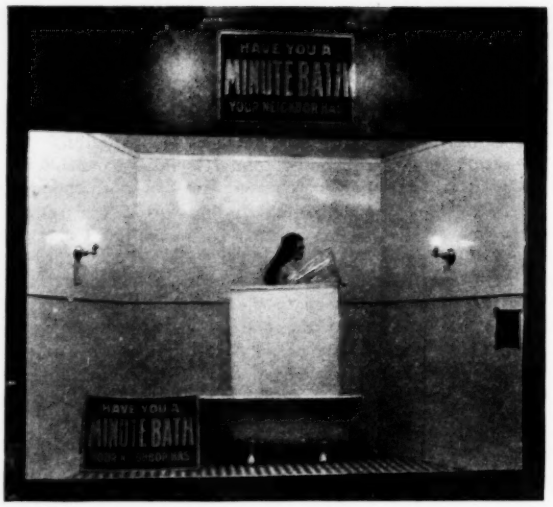
There is a Paul Water System to meet all requirements of any capacity, pumping from shallow or deep well, cistern or spring.

BLOCH BATH FIXTURE

The sanitary fixture. No inner overflow tube to gather dirt or germs. No closet necessary in back of fixture.

All repairs made from face of fixture. Installed in one-fifth the time of any other fixture. Can be installed on any built-in bath. Costs one-half that of any other fixture.

Leon Bloch Brass Co.
28-30 West 22nd St. New York City



A "Bath a Day" on a Detroit Boulevard.

The booth enclosing the display is approximately twenty feet long by about eight feet in depth and twelve feet in height. The floor of the interior is covered with real linoleum in a blue and white checked design and the sidewalls and ceiling are done in white enamel. The booth is of frame construction, weatherproof and entirely covered on the top and sides with a heavy quality of galvanized iron, to comply with the ordinance governing fire hazards. The front is of plate glass, affording a very clear view of the exhibit. The entire display cost approximately $1000 to erect and maintenance is estimated as being about fifty dollars per month. However the display has considerable value from a salvage standpoint, as all of the articles used in it, can suffer no ill-effects from inclement weather and may be removed in as good condition as when first used. The display is especially interesting to the plumbing trades because it shows how one firm introduced its product to the public and got them to talking about it. It also proves that plumbing supplies and equipment coupled with clever ideas, can make very attractive and business-getting displays.

It has humorously been rumored in Detroit that the sign is shortly to be dismantled, owing largely to the great and increasing number of traffic accidents occurring directly in front of the display.

NEW BUSINESS VENTURES.

Firms recently reported as new in the plumbing and heating industry are as follows:

Frederickson & Quigley, Saugatuck, Conn.; plumbing.

Zeigler Plumbing & Heating Co., Zeigler, Ill.; plumbing and heating.

The City Plumbing Co., Osawatomie, Kans.; plumbing.

Peter Mahony, 1745 Taylor Ave., Detroit, Mich.; plumbing and heating.

George McGibney, Lincoln, Maine; plumbing.

New incorporations reported are as follows:

Orlando Plumbing Construction Co., Orlando, Fla.; plumbing.

Egyptian Supply Co., Christopher, Ill., plumbing, heating and supplies.

Hudson Plumbing Supply Co., Union Hill, N. J.; plumbing supplies.

Charles Harrison & Co., Arverne, L. I., N. Y.; plumbing.

Concourse Plumbing Corporation, Manhattan, N. Y.; plumbing.

North Syracuse Hardware & Plumbing Co., North Syracuse, N. Y.; plumbing and hardware.

Pettit & Horton, Wilson, N. Y.; merchandise and plumbing.

Mahlon H. Rickert & Sons, Sellersville, Pa.; heating.

Bryce Plumbing & Heating Co., Florence, S. C.; plumbing and heating.

Business Changes.

Business changes, changes in address and changes in firm names recently reported are:

Geo. L. Dickson, Ceres, Calif.; successor to T. A. Crawford; plumbing.

Chas. Marsden & R. J. Brown, Van Nuys, Calif.; successor to W. H. Smith; plumbing and electrical supplies.

Alfred Tanner, New Haven, Conn.; successor to John T. Webb; plumbing.

Harry Weinberger, 9114 Oakland Ave., Detroit, Mich.; successor to Alert Plumbing and Heating Co.; plumbing and heating.

N. K. Marvin, Caledonia, N. Y.; successor to Marvin & Scott; hardware and plumbing.

H. B. Klein, Welch, W. Va.; successor to Klein & Solins; plumbing.

Arus Greenfield, 829 Locust St., Philadelphia, Pa.; successor to Frank Horowitz; plumbing, gas fitting, steam and hot water heating.

The A. D. Wilson Co., formerly of 162 Charles St., has moved to 75 Laurel St., Fitchburg, Mass.

J. M. Massa Plumbing Co., formerly on Pontotoc St., has moved to 184 Vance Ave., Memphis, Tenn.

The Ideal Heating Co., formerly located in the Cordova Hotel Bldg., has moved to 187 Madison Ave., Memphis, Tenn.

Ernst & Wolf, formerly at 221 Stewart St., has moved to 312 Fifth Ave., Seattle, Wash.

F. J. Matthews, formerly of 1512 Western Ave., has moved to 1247 Westlake Ave., N. Seattle, Wash.

B. T. Peistrup, formerly of 5004 20th Ave., N. W., has moved to 5433 Ballard Ave., Seattle, Wash.

Obituary

HARRY D. CRANE.

Harry D. Crane, Cincinnati business man, who was a noted heating and ventilating engineer, died Sept. 15, at his home in Avondale, a suburb of Cincinnati, O., after an illness extending over a period of several years. Mr. Crane who was 68 years of age was the son of M. H. Crane, founder of the heating and ventilating firm of Crane & Company, to which he afterwards succeeded as president. Mr. Crane was born in Cincinnati and received his preliminary education at the Chickering Institute. All his business life, which covered more than forty years, was devoted to the company which bore his family name.

Mr. Crane was a prominent member of the Cincinnati Business Men's Club, serving on its Board of Directors and also on many of its committees. For several years he headed its special Santa Claus Committee, which provided Christmas cheer for poor children. Until the failure of his health, he was one of the regular members of the jovial circle around the Knockers' table at the club. In his earlier years he had been keenly interested in athletics. He was one of the leading spirits in the former Avondale Athletic Club and managed its baseball club, which was one of the famous organizations of twenty years ago. Mr. Crane also was a member of several fraternal organizations.

Pierce Pebco

Steam and Water Boilers

CAPACITIES

From 325 to 1550 Steam

From 525 to 2500 Water

Order from us or through your local jobber

Pierce, Butler & Pierce Manufacturing Corp.

Brooklyn, Boston, Worcester, Detroit, NEW YORK, Syracuse, Newark, Philadelphia, Baltimore, Washington

ACME DETROIT Drinking Fountain

Adjustable to All Pressures

A strictly sanitary fixture suitable for use in all classes of buildings. The price is right, too.

We make a line of high grade

Basin Cocks — Wash Tray Bibbs
Sink Bibbs — Sill Cocks
Drinking Fountains — Boiler Drain Cocks
Solder Nipples

If your jobber hasn't our goods in stock write us, giving his name.

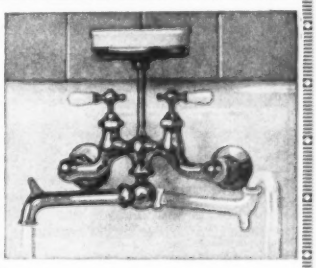
Acme Brass Works, Detroit, Mich.

Eastern Representatives: Kessel & Muller, New York
Western Representative: H. E. Crum Jr., 79 W. Monroe St., Chicago, Ill.

Everybody Likes It

Wherever the Gopher Combination Sink Faucet and Drinking Fountain is used, it is highly approved.

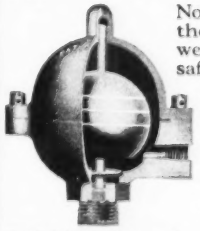
The "three-in-one" feature and splendid appearance make an instant appeal to the housewife. If you have not seen this fixture, order one today—you'll want more.



All good jobbers carry the Gopher Line of Fuller, Compression, Quick-Opening and Ground Key Work, Ball Cocks, etc.

Union Brass & Metal Mfg. Co. (Established 1892) ST. PAUL MINNESOTA

Red Top Relief Valve



Nothing secret or complicated about the RED TOP. Send the coupon—we'll tell you all about this sure safety device for closed systems.

PHILADELPHIA METER CO.
Philadelphia, Pa.
Tell me about the *RED TOP*.
Name .....
Address .....
City & State .....
Jobber's Name .....

Philadelphia Meter Co.
942 Real Estate Trust Bldg.
PHILADELPHIA - PA

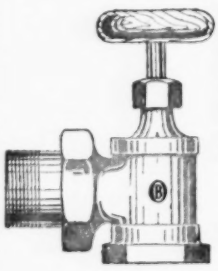
MYERS

WE are manufacturers of the well established line of Myers Single and Double Acting, Force and Lift, Hand, Windmill and Power Pumps; Tank Pumps and Hydro-Pneumatic Pumps; Electric House Pumps and Direct Water Systems; Self-Oiling Power Pumps and Working Heads; Spray Pumps and Accessories; Cylinders and Power Working Barrels.

If you are a prospective purchaser of a pump for home, farm, mill, mine or factory, write us for catalog and prices.

THE F. E. MYERS & BRO. CO. Ashland, Ohio

PUMPS For Every Purpose



Buy O-B Quality First Valves From Your Supply House

The Ohio Brass Company
Mansfield, Ohio

50 Church St. New York City — 343 S. Dearborn St. Chicago — 710 Witherspoon Bldg. Philadelphia

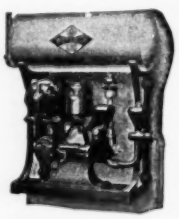
WM. P. HORN CO., *Pacific Coast Agents*
Los Angeles — Seattle — Portland — San Francisco

MONARCH
AUTOMATIC ELECTRIC WATER SYSTEMS

$117.00 Plus Freight from Dayton

MONARCH Water Systems are medium priced—some are higher, perhaps some are lower, but none are better at any price.

The Monarch line of deep and shallow well pumps covers every water supply requirement. Write for details



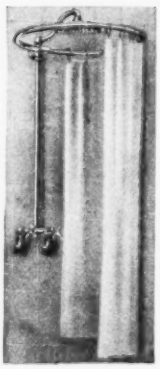
The Monarch Engineering Co.
250 E. First Street Dayton, Ohio
Export Office:
O. P. Brett, Mgr., 136 Water Street, New York

MONARCH Wall Unit

Hudson Shower

No. 100 Complete Two Valve Shower

Send for Catalog No. 21 illustrating complete line of showers and bath fixtures

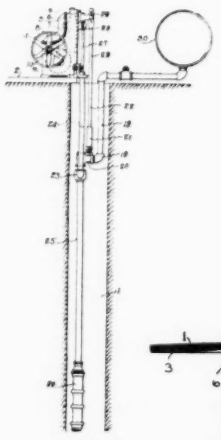


Hudson Brass Works
16 Nassau Street, Brooklyn, N. Y.

Plumbing Department.

1,428,181. Pump. Philip A. Myers, Ashland, Ohio, assignor to The F. E. Myers and Brother Company, Ashland, Ohio, a Corporation of Ohio.

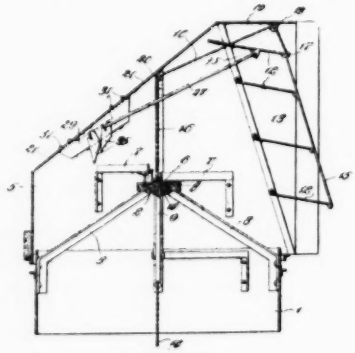
In a pumping apparatus, the combination with a power head including a casing in which the power mechanism is housed, of a mounting head detachably secured to a vertical face of said casing, a drop pipe secured to the mounting head and a lower cylinder, an upper cylinder all supported by such drop pipe and an air cylinder, a piston rod common to the lower and upper water cylinders and another piston rod for the air cylinder, and a connection between said piston rods and an operating extension of the power mechanism.



1,428,181.

1,428,228.

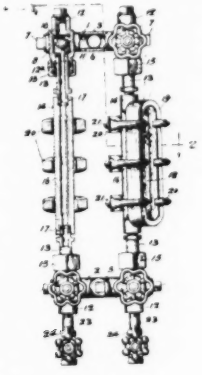
1,428,228. Kitchen-Sink Water-Stop Plug. Florence Crane Grover, Hollywood, Calif. A plug stop comprising a metal disc and a second disc of cork secured together by means of a staple, the metal disc being flexed concavely, the shank of the staple being formed to act as a securing means to lock the plug stop in position over an outlet to be closed, whereby the second disc is wedged against the floor of the sink, the diameters of the discs being substantially equal to each other and greater than the diameter of the outlet to be closed.



1,427,917

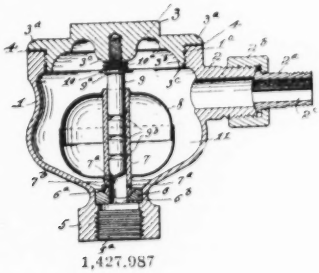
1,427,917. Holding Means for Ventilator Louvers and the Like. Walter Skipworth, Cleveland, Ohio, assignor to The Ohio Blower Company, Cleveland, Ohio, a Corporation of

Ohio.. A ventilating device comprising a hood portion having an opening therein, a plurality of louvers adapted to move in unison to open and close said opening, a flexible element secured to said louvers and extending through said hood to a point within the building on which said device is mounted, a substantially U-shaped member pivotally connected to said louvers and extending within the hood, a stationary member fastened to said hood and provided with a plurality of notches, and a dog pivoted adjacent each of said notches, said U-shaped member being adapted to engage said notches upon a downward pull of said flexible element thereby to move said member in one dirction and engage said dogs to override said notches when said flexible element is released to permit said member to move in the opposite direction.



1,428,162.

1,428,162. Water-Level Gauge. John W. Grantland, Cincinnati, Ohio. In a device of the class described, a pair of water level gauges arranged side by side, each gauge comprising a casing, providing a longitudinal sight chamber and sight opening, a glass plate providing a closure for the casing opening, means for clamping the glass plate to the casing, said casing having nipples at its opposite ends, a tubular extension connecting with the casing upper nipple, and a tubular extension connecting with the casing lower nipple, T-shaped manifolds for respectively connecting the opposite ends of said water gauges and supporting the gauges side by side, each manifold at its opposite ends and forward side provided with a hollow valve body portion in communication with the conduit of the manifold, and each valve body portion provided with oppositely disposed nipple extensions at opposite sides of the body portion and transverse to the manifolds, one thereof connecting with a respective tubular extension of one of said gauges.



1,427,987.

1,427,987. Steam Trap. Charles E. Welsh, Cleveland, Ohio. Filed Jan. 15, 1921. 1. In a steam trap, the combination of a casing, and a closure cap in the top thereof, said casing having an inlet connection, and provided with a discharge connection in the bottom thereof, a valve-seat in the discharge element, a valve operative on said seat, said valve comprising a tubular stem having a float attached thereto a guide element fixed in the closure cap, depending therefrom and having a sliding

For fifty years we have manufactured the

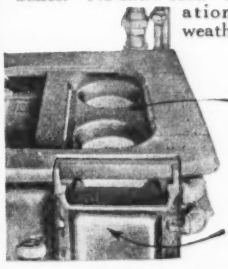
BARRETT
Back Water, Sewer and Tide Trap

and it always has been and now is the best fixture for its purpose on the market.

James Barrett Mfg. Co. 115-121 Pearl St. Boston, Mass.

"Thrift" House Heating Range

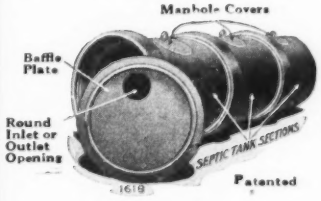
Heats 8-room house by hot water. Gives separate domestic hot water. Cooks and bakes. No extra coal. 350 sq. ft. of radiation. 70° in zero weather guaranteed.



Write for details. Exclusive agents wanted

Zimmerman Stove Heater Corp. Jamaica, N. Y.

A Material You Prefer to Install



Write for complete details

The Dickey Septic Tank is made in sections of Vitrified Salt Glazed Clay and is as easy to install as Vitrified Sewer Pipe.

No forms, bolts, or reinforcing to complicate the work.

Your customer will also prefer this permanent material when he understands its merits as you know them from experience.

W. S. DICKEY CLAY MFG. CO.
KANSAS CITY Established 1885 MISSOURI

Deegan's
THREAD-JOINT SEAL

NO Leaks, Rust, Hardening in joints, Dirty hands, Cause for worry, Deterioration, Better products made

Holds the pressure and does not harden

COMPARE IT WITH LEAD

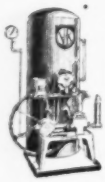
If your supply house does not carry Deegan's Thread-Joint Seal, send us his name and we will see that you are supplied.

Chard & Howe 256 Front Street NEW YORK CITY

FOR lasting quality and true capacity use "*Koven*" Pure Iron Double Row Riveted, Galvanized Range Boilers, or *Naco* Galvanized Range Boilers made of open hearth steel. These boilers may be bought of jobbers everywhere.

L. O. KOVEN & BRO.
154 Ogden Ave. Jersey City, N. J.

"V & K" Water Supply Systems



Have established themselves among the trade by the increased business they have brought to those plumbers who recommend and install them.

Every "V & K" installed means more friends and customers. Many dealers have used "V & K" pumps as a basis to increase and expand their business.

Write us for sales assistance

The Vaile-Kimes Company
DAYTON, OHIO

Pacific Boilers are Easily Installed

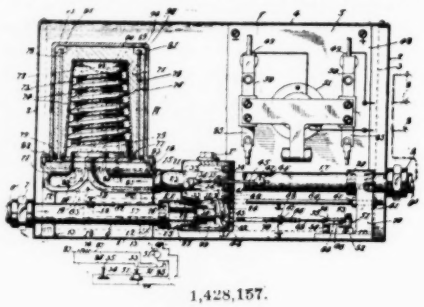
ENGINEERING feats are not necessary to install Pacific Steel Boilers in old or new buildings. The shell is easily detached from the firebox. An opening large enough to admit the firebox is all that is necessary.

General Boilers Company
Waukegan, Illinois

fit in the bore of the tubular stem, apertures provided in the valve stem above the valve-seat, for engagement with a key adapted for insertion through the outlet, whereby said valve may be rotated on the valve-seat.

Heating Department.

1,428,157. Electric Water Heater. Alexander Fisher, New York, N. Y., assignor to Fisher Patents Co., Inc., a corporation of New York. 1. A water heating unit comprising a hydraulically operated member directly subjected to the pressure of the water in a main pipe, an electric heat-

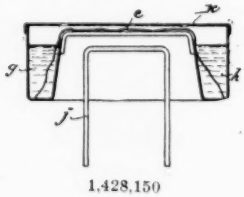


1,428,157.

producing member in the path of water flow, an electric switch member for controlling the circuit to said heat-producing member, and a mechanical connection between said hydraulically operated member and said switch to cause the latter to be closed automatically upon displacement of the former, a single casing enclosing all of said elements, hydraulic connecting elements through said casing for establishing connection between the water mains and the heater unit, and electric connections extending through the casing for establishing circuit between the electric mains and the heater, whereby said unit may be installed at any point between the mains and the outlets to heat water for delivery at any of said outlets, the opening of any outlet effecting the flow of water for actuating the motive element to close the switch.

1,428,349. Heating Device. Martin J. Whelan, Clifton Heights, Pa. In a heating device the combination of a container having an access opening leading to the interior thereof, an interiorally threaded flange surrounding said opening, a plug having a bore therethrough of two different diameters, the larger diameter forming a chamber for the reception of packing material, said plug having threaded connection with the flange, a packing gland having threaded connection with the plug to set up the packing within the chamber, and a heating element connected with the plug and held in position by the compressed packing in the packing chamber.

1,428,150. Vaporizing Device for Heating Apparatus. Ernest Deleamont, Marseille, France. 2. A humidifier, comprising a pair of liquid-containing troughs connected together in spaced relation and adapted to straddle a source of heat

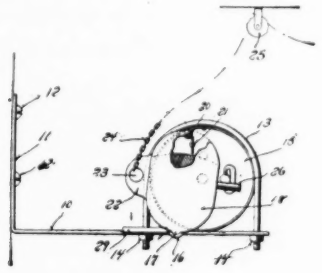


1,428,150

so as to be disposed at opposite sides thereof, the inner side walls of the troughs and the connections between said troughs conjointly defining a heating chamber which is open at top and bottom; imperforate liquid-absorbing material extending across the top of said chamber to form a roof for confining and retaining the heat in the chamber and having the opposite side portions thereof immersed in the liquid in said troughs;

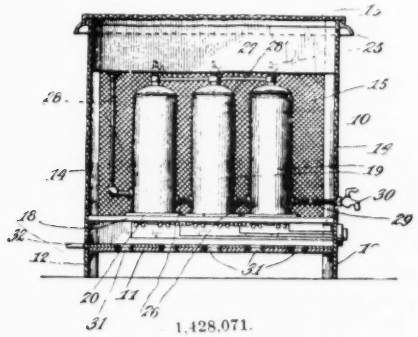
and a cover embodying imperforate side portions immediately overlying said troughs and a perforated central portion immediately overlying said roof.

1,428,255. Alarm Control for Dampers. Harry Rietveld, Milwaukee, Wis. 1. The combination of an alarm clock, a support therefor, a weight, a projection thereon, a support for said projection said projection and said support having limited points of contact to permit said weight to move and fall from said support, and a lug on said weight contacting with the winding wing of the alarm of said clock for holding said weight in stable position until the alarm goes off and the wing rotates.



1.428,255.

1,428,071. Electric Heater. Pierre Joseph Henri Bernard, Montreal, Quebec, Canada. 4. In a heater such as described, a plurality of reticulated side and end walls, a base upon which said walls are mounted, a cover secured to said walls, a support mounted upon the base, a plurality of electric heating elements mounted upon the support, casings for said elements, water jackets surrounding said casings, nipples connecting said water jackets, a tank, a pipe connecting the tank and one of said water jackets, an outlet pipe leading from one of said water jackets, vent openings for said water jackets, said base having openings therein, means for controlling said openings, and means for operatively wiring the heating elements, and a switch for controlling said elements.



1,428,071.

ISSUE WARNING ON ANTHRACITE SUBSTITUTES.

In the face of the impending coal famine, the National Board of Fire Underwriters has issued a bulletin warning those who will have to use anthracite substitutes of the dangers liable to their use, the main points of the article being:

Bituminous coal, very combustible, should not be piled near the furnace or wall of wooden bin. To avoid chimney fires, smoke pipes and flues should be thoroughly cleaned out; furnaces should be encased with fireproof covering, all nearby woodwork should be covered with incombustible material, and smoke pipes should be removed at least 18 inches from wood or plaster. The same dangers attend the burning of wood.

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Manufactured by

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Flush Valves for use in combination with all styles of bowls for all classes of service to operate under low or high pressure water supply.

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An easy, quick and cheap way of connecting up new fixtures with old line of Soil Pipe—

SISSON Insertable Joint

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Saves time and labor and makes a perfect job.

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Against Flooded Basements

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TRADE MARK SIGNET REG. U.S. PAT. OFF.

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Classified Advertisements

8 cents for each word including heading and address. Count seven words for keyed address. Minimum $2.00. One inch $4.00. Cash must accompany order. Copy should reach us Tuesday morning.

Situations Open

GOOD POSITION OPEN FOR SALESman who is acquainted with the plumbing and heating trade in Chicago. Address 625, "Domestic Engineering," 1900 Prairie Ave., Chicago.

WANTED—EXPERIENCED PLUMBER to instruct Plumbing class in practical work with business experience preferred for Indiana University town. Good salary. Steady position. Address 626, "Domestic Engineering," 1900 Prairie Ave., Chicago. 9-23

WANTED—FIRST CLASS COMBINATION plumber and steamfitter. Ideal living and working conditions. Only first-class workmen need apply. Address 624, "Domestic Engineering," 1900 Prairie Ave., Chicago. 9-23

For Sale

FOR SALE — PLUMBING, HEATING and tinning business. Wonderful location, county seat. New stock and complete equipment. Box 433, Mt. Carroll, Ill. 9-23/30

FOR SALE

Wall Radiator Brackets

We have 3000 Wall Radiator Brackets to dispose of, either in small or large quantities. Price each, 80 cents. Special price on lots of 100 or more. We will send a sample Bracket C. O. D. for your approval.

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Situations Wanted

SITUATION WANTED—BY PLUMBER and fitter. Good lead worker. Wants steady position. Can invest some money. Address 622, "Domestic Engineering," 1900 Prairie Ave., Chicago. 9-16-23

SITUATION WANTED — THOROUGH competent bookkeeper and office man. Address 621, "Domestic Engineering," 1900 Prairie Ave., Chicago. 9-16-30

Miscellaneous

TIME SHEETS, JOB TICKETS, ESTImating blanks, etc., for plumbers. Small or large lots. Reasonable. Samples and prices free. Prompt service. Louis Fink & Sons, Inc., Laurel Springs, N. J. 7-30 tf

SELL US YOUR SURPLUS PIPE COUplings. Write us. The A. & J. Mfg. Co., 557 W. Lake St., Chicago. tf

We pay good money for unused couplings, that you throw away. Send us list of your accumulation.

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LABORATORY SERVICE.
Consult an expert chemist by mail. Your chemical problem solved and working formula furnished FIVE DOLLARS. Write me. W. Stedman Richards, Consulting Chemist, Box 2402, Boston, Mass.

PATENTS

And Trademarks Secured. Write, phone or call for information. Williamson & Williamson, 1325 Arch St., Philadelphia, Pa.

WANTED — PATTERN EQUIPMENT for standard brass plumbing line, such as traps, wastes, and drains. Medina Stamping & Machine Co., Inc., Medina, New York. 9-23/30

PLUMBERS' STOP VALVE TAGS FOR marking stop cocks and valves in houses or large buildings. These tags printed with your name and address make an everlasting advertisement for your business. Send for samples and copy of chart "How to Tag Stop Cocks and Valves." Haddon Bin Label Co., Haddon Heights, N. J.

Government Proposals

TREASURY DEPARTMENT, SUPERvising Architect's Office, Washington, D. C., September 18, 1922.—Sealed proposals will be opened in this office at 3 p. m., Oct. 16, 1922, for the Mechanical Equipment (exclusive of outside services, elevators, lifts, and lighting fixtures) of an Infirmary Group (4 buildings) at the U. S. Veterans' Hospital, Chelsea, N. Y. Specifications may be obtained at this office in the discretion of the Supervising Architect. Proposals will be considered only from individuals, firms, or corporations possessing satisfactory financial and technical ability, equipment, and organization to insure speedy completion of the contract, and who have established a record for expedition on contracts of similar character and magnitude. The fact that any concern obtains a set of the plans and specifications from any source whatever and submits a bid shall not constitute a waiver of the foregoing stipulations. Jas. A. Wetmore, Acting Supervising Architect. 9-23-30

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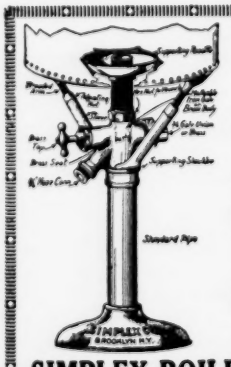

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Will carry twenty sizes of boilers. Supporting arms easily attached to all sizes.

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